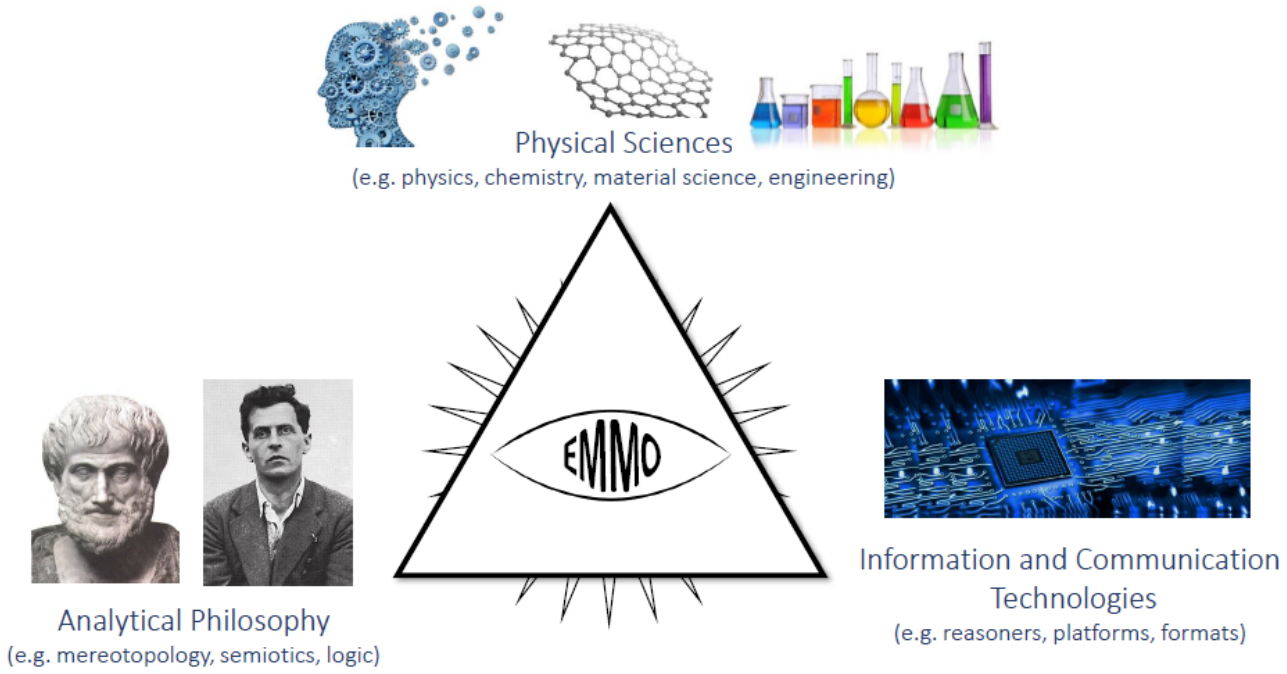
Europeean Materials Modelling Ontology

Version 1.0.0-beta

European Materials Modelling Counsil (EMMC)

November 04, 2020



Abstract

EMMO is an ontology that is created by the Europeean Materials Modelling Council (EMMC) to provide a formal way to describe the fundamental concepts of physics, chemistry and materials science. EMMO is designed to pave the road for semantic interoperability providing a generic common ground for describing materials, models and data that can be adapted by all domains.

It is a representational framework of predefined classes and axioms (ontology) provided by experts (EMMC) that enables end users (industry, research, academy) to represent real life physical entities (materials, devices), models and properties using ontological signs (individuals) in a standard way to facilitate interactions and exchanges (data, software, knowledge) between all involved material modelling and characterization communities and stakeholders.

Keywords: EMMO, materials science, modelling, characterisation, materials, ontology

Authors:

Emanuele Ghedini, University of Bologne

Gerhard Goldbeck, Goldbeck Consulting

Jesper Friis, SINTEF

Adham Hashibon, Fraunhofer IWM

Georg Schmitz, ACCESS

Contents

1 Introduction **2**
What is an ontology . . . 3
Primitive elements in EMMO . . . 4
Theoretical foundations . . . 5
The structure of EMMO . . . 9

2 EMMO Relations **12**
Root of EMMO relations . . . 12
Mereotopological branch . . . 13
Connected branch . . . 14
Has Part branch . . . 15
Semiotical branch . . . 18

3 EMMO Classes **22**
EMMO branch . . . 22
Elementary branch . . . 24
Perspective branch . . . 24
Holistic branch . . . 25
Semiotic branch . . . 26
Sign branch . . . 27
Interpreter branch . . . 32
Object branch . . . 33
Conventional branch . . . 33
Property branch . . . 35
Icon branch . . . 38
Process branch . . . 39
Perceptual branch . . . 41
Graphical branch . . . 42
Geometrical branch . . . 47
Symbol branch . . . 49
Mathematical branch . . . 56
Mathematical Symbol branch . . . 60
Mathematical Model branch . . . 60
Mathematical Operator branch . . . 62
Metrological branch . . . 64
Physical Dimension branch . . . 71
Physical Quantity branch . . . 78
Number branch . . . 104
Measurement Unit branch . . . 105
UTF8 branch . . . 116
SI Base Unit branch . . . 117
SI Special Unit branch . . . 119
Prefixed Unit branch . . . 125
Metric Prefix branch . . . 126
Quantity branch . . . 131
Base Quantity branch . . . 133
Derived Quantity branch . . . 137
Physical Constant branch . . . 160
Reductionistic branch . . . 166

Expression branch . . . 171
Physicalistic branch . . . 172
Elementary Particle branch . . . 173
Subatomic branch . . . 174
Matter branch . . . 176
Fluid branch . . . 179
Mixture branch . . . 183
State Of Matter branch . . . 190

4 Individuals **197**

5 Appendix **198**
The complete taxonomy of EMMO relations . . . 198
The taxonomy of EMMO classes . . . 198

Chapter 1

Introduction

EMMO is a multidisciplinary effort to develop a standard representational framework (the ontology) based on current materials modelling knowledge, including physical sciences, analytical philosophy and information and communication technologies. This multidisciplinarity is illustrated by the figure on the title page. It provides the connection between the physical world, materials characterisation world and materials modelling world.

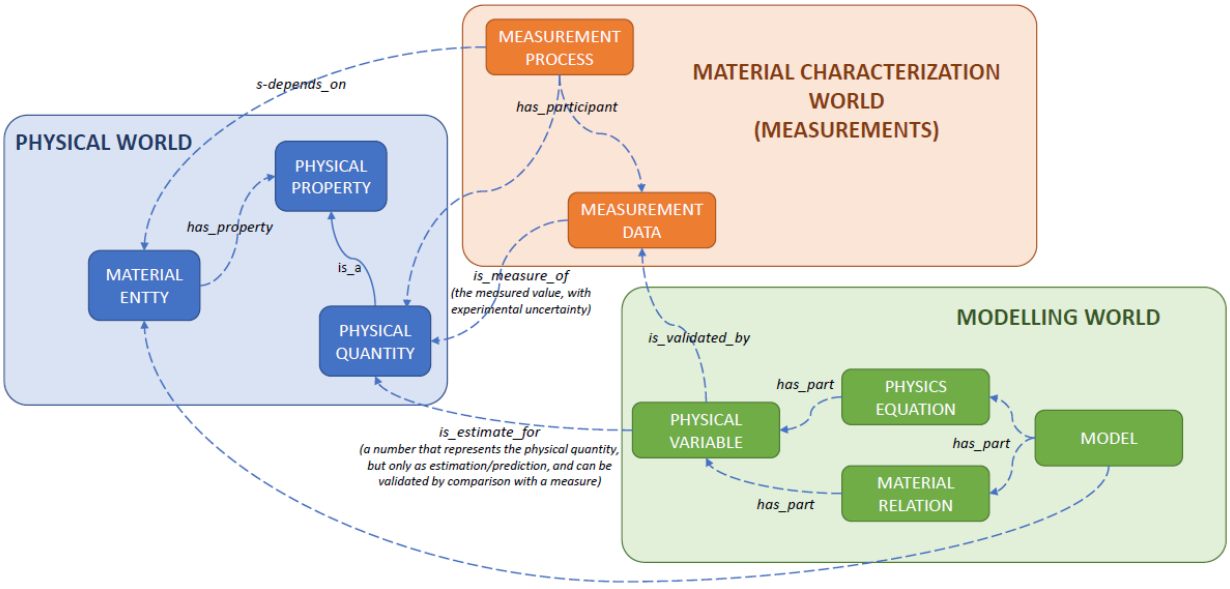


Figure 1.1: EMMO provides the connection between the physical world, materials characterisation world and materials modelling world.

EMMO is based on and is consistent with the Review of Materials Modelling, CEN Workshop Agreement and MODA template. However, while these efforts are written for humans, EMMO is defined using the Web Ontology Language (OWL), which is machine readable and allows for machine reasoning. In terms of semantic representation, EMMO brings everything to a much higher level than these foundations.

As illustrated in the figure below, EMMO covers all aspects of materials modelling and characterisation, including:

- the **material** itself, which must be described in a rigorous way
- the **observation process** involving an observer that percieves the real world (characterisation)
- the **properties** that are measured or modelled
- the **physics laws** that describe the material behaviour
- the **physical models** that approximate the physics laws
- the **solver** including the numerical discretisation method that leads to a solvable mathematical representation under certain simplifying assumptions
- the **numerical solver** that performs the calculations
- the **post processing** of experimental or simulated data

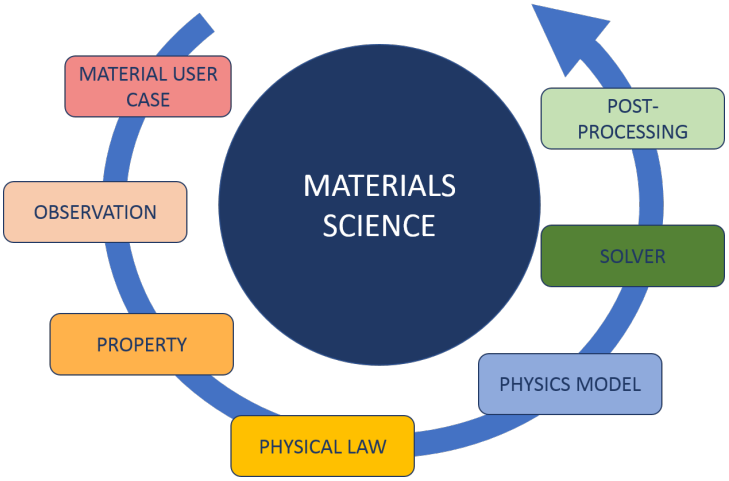


Figure 1.2: The aspects of materials modelling and characterisation covered by EMMO.

EMMO is released under the Creative Commons license and is available at emmo.info/. The OWL2-DL sources are available in RDF/XML format.

What is an ontology

In short, an ontology is a specification of a conceptualization. The word *ontology* has a long history in philosophy, in which it refers to the subject of existence. The so-called ontological argument for the existence of God was proposed by Anselm of Canterbury in 1078. He defined God as *"that than which nothing greater can be thought"*, and argued that *"if the greatest possible being exists in the mind, it must also exist in reality. If it only exists in the mind, then an even greater being must be possible – one which exists both in the mind and in reality"*. Even though this example has little to do with todays use of ontologies in e.g. computer science, it illustrates the basic idea; the ontology defines some basic premises (concepts and relations between them) from which it is possible reason to gain new knowledge.

For a more elaborated and modern definition of the ontology we refer the reader to the one provided by Tom Gruber (2009). Another useful introduction to ontologies is the paper Ontology Development 101: A Guide to Creating Your First Ontology by Noy and McGuinness (2001), which is based on the Protege sortware, with which EMMO has been developed.

A taxonomy is a hierarchical representation of classes and subclasses connected via `is_a` relations. Hence, it is a subset of the ontology excluding all but the `is_a` relations. The main use of taxonomies is for the organisation of classifications. The figure shows a simple example of a taxonomy illustrating a categorisation of four classes into a hierarchy of more higher of levels of generality.

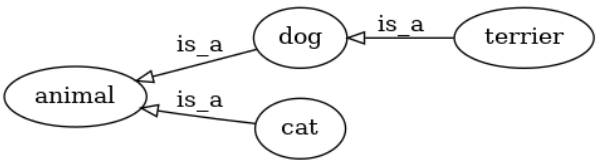


Figure 1.3: Example of a taxonomy.

In EMMO, the taxonomy is a rooted directed acyclic graph (DAG). This is important since many classification methods relies on this property, see e.g. Valentini (2014) and Robison et al (2015). Note, that EMMO is a DAG does not prevent some classes from having more than one parent. A `Variable` is for instance both a `Mathematical` and a `Symbol`. See appendix for the full EMMO taxonomy.

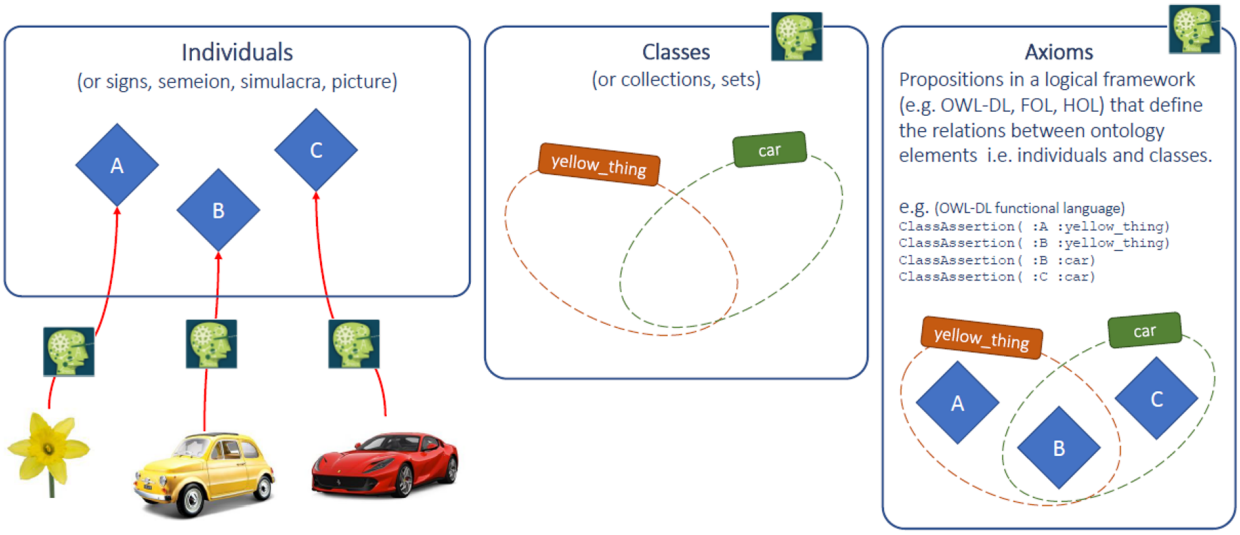


Figure 1.4: The primitive building blocks of EMMO.

Primitive elements in EMMO

Individuals

Individuals are the basic, "ground level" components of EMMO. They may include concrete objects such as cars, flowers, stars, persons and molecules, as well as abstract individuals such as a measured height, a specific equation and software programs.

Individuals possess attributes in form of axioms that are defined by the user (interpreter) upon declaration.

Classes

Classes represent concepts. They are the building blocks that we use to create an ontology as a representation of knowledge. We distinguish between *defined* and *non-defined* classes.

Defined classes are defined by the requirements for being a member of the class. In the graphical representations of EMMO, defined classes are orange. For instance, in the graph of the top-level entity branch below, The root `EMMO` and a defined class (defined to be the disjoint union of `Item` and `Collection`).

Non-defined classes are defined as an abstract group of objects, whose members are defined as belonging to the class. They are yellow in the graphical representations.

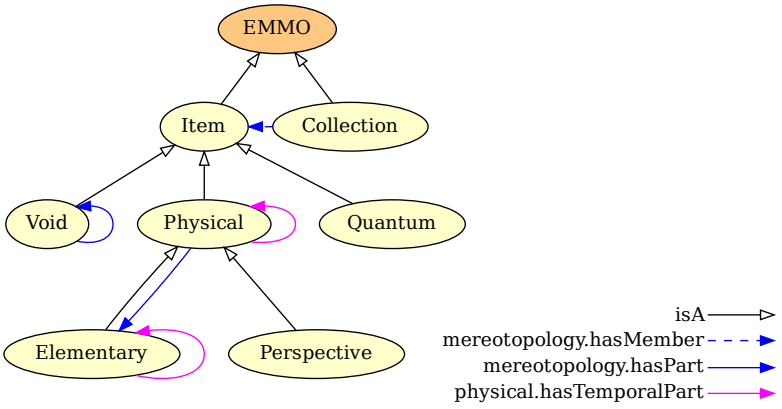


Figure 1.5: Example of the top-level branch of EMMO showing some classes and relationships between them.

Axioms

Axioms are propositions in a logical framework that define the relations between the individuals and classes. They are used to categorise individuals in classes and to define the *defined* classes.

The simplest form of a class axiom is a class description that just states the existence of the class and gives it an unique identifier. In order to provide more knowledge about the class, class axioms typically contain additional components that state necessary and/or sufficient characteristics of the class. OWL contains three language constructs for combining class descriptions into class axioms:

- *Subclass* (`rdfs:subClassOf`) allows one to say that the class extension of a class description is a subset of the class extension of another class description.
- *Equivalence* (`owl:equivalentClass`) allows one to say that a class description has exactly the same class extension (i.e. the individuals associated with the class) as another class description.
- *Distjointness* (`owl:disjointWith`) allows one to say that the class extension of a class description has no members in common with the class extension of another class description.

See the section about Description logic for more information about these language constructs. Axioms are also used to define relations between relations. These are further detailed in the chapter on Relations.

Theoretical foundations

EMMO build upon several theoretical frameworks.

Semiotics

Semiotics is the study of meaning-making. It is the dicipline of formulating something that possibly can exist in a defined space and time in the real world.

Mereotopology

Mereotopology is the combination of **mereology** (science of parthood) and **topology** (mathematical study of the geometrical properties and conservation through deformations). It is introdused via the `Item` class and based on the `mereotopological` relations. Items in EMMO are always topologically connected in space and time. EMMO makes a strong distinction between membership and parthood relations. In contrast to collections, items can only have parts that are themselves items. For further information, see Casati and Varzi "Parts and Places" (1999).

Physics

EMMO is strongly based on physics, with the aim of being able to describe all aspects and all domains of physics, from quantum mechanics to continuum, engeneering, chemistry, etc. EMMO is compatible with both the De Broglie - Bohm and the Copenhagen interpretation of quantum mecanics (see `Physical` for more comments).

EMMO defines a physics-based parthood hierachy under `Physical` by introducing the following concepts (illustrated in the figure below):

- `Elementary` is the fundamental, non-divisible constituent of entities. In EMMO, elementaries are based on the standard model of physics.
- `State` is a `Physical` whose parts does not change during its life time (at the chosen level of granularity). This is consistent with a state within e.g. thermodynamics.
- `Existent` is a succession of states.

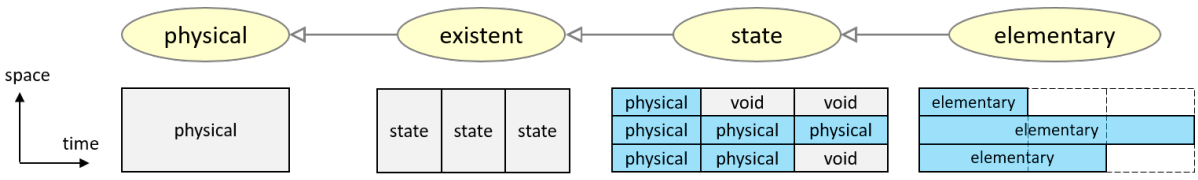


Figure 1.6: Parthood hierachy under `Physical`.

Metrology

Metrology is the science of measurements. It introduces units and links them to properties. The description of metrology in EMMO is based on the standards of International System of Quantities (ISQ) and International System of Units (SI).

Description logic

Description logic (DL) is a formal knowledge representation language in which the *axioms* are expressed. It is less expressive than first-order logic (FOL), but commonly used for providing the logical formalism for ontologies and semantic web. EMMO is expressed in the Web Ontology Language (OWL), which in turn is based on DL. This brings along features like reasoning.

Since it is essential to have a basic notion of OWL and DL, we include here a very brief overview. For a proper introduction to OWL and DL, we refer the reader to sources like Grau et.al. (2008), OWL2 Primer and OWL Reference.

OWL distinguishes between six types of class descriptions:

1. a class identifier (a IRI reference)
2. an exhaustive enumeration of individuals that together form the instances of a class (`owl:oneOf`)
3. a property restriction (`owl:someValuesFrom`, `owl:allValuesFrom`, `owl:hasValue`, `owl:cardinality`, `owl:minCardinality`, `owl:maxCardinality`)
4. the intersection of two or more class descriptions (`owl:intersectionOf`)
5. the union of two or more class descriptions (`owl:unionOf`)
6. the complement of a class description (`owl:complementOf`)

Except for the first, all of these refer to *defined classes*. The table below shows the notation in OWL, DL and the Manchester OWL syntax, all commonly used for the definitions. The Manchester syntax is used by Protege and is designed to not use DL symbols and to be easy and quick to read and write. Several other syntaxes exist for DL. An interesting example is the pure Python syntax proposed by Lamy (2017), which is used in the open source Owlready2 Python package. The Python API for EMMO is also based on Owlready2.

Table 1.1: Notation for DL and Protege. A and B are classes, R is an active relation, S is an passive relation, a and b are individuals and n is a literal. Inspired by the Great table of Description Logics.

DL	Manchester	Python + Owlready2	Read	Meaning
Constants				
$\top$		Thing	top	A special class with every individual as an instance
$\bot$		Nothing	bottom	The empty class
Axioms				
$A \doteq B$			A is defined to be equal to B	Class *definition*
$A \sqsubseteq B$	A subclass_of B	class A(B): …	all A are B	Class *inclusion*
		issubclass(A, B)		Test for *inclusion*
$A \equiv B$	A equivalent_to B	A.equivalent_to.append(B)	A is equivalent to B	Class *equivalence*
		B in A.equivalent_to		Test for equivalence
$a : A$	a is_a A	a = A()	a is a A	Class *assertion* (*instantiation*)
		isinstance(a, A)		Test for instance of
$(a, b) : R$	a object property assertion b	a.R.append(b)	a is R-related to b	Property *assertion*
$(a, n) : R$	a data property assertion n	a.R.append(n)	a is R-related to n	Data *assertion*
Constructions				

DL	Manchester	Python + Owlready2	Read	Meaning
$A \sqcap B$	A and B	A & B	A and B	Class *intersection* (*conjunction*)
$A \sqcup B$	A or B	A | B	A or B	Class *union* (*disjunction*)
$\neg A$	not A	Not(A)	not A	Class *complement* (*negation*)
$\{a, b, ...\}$	{a, b, ...}	OneOf([a, b, ...])	one of a, b, ...	Class *enumeration*
$S \equiv R^-$	S inverse_of R	Inverse(R) S.inverse == R	S is inverse of R	Property *inverse* Test for *inverse*
$\forall R.A$	R only A	R.only(A)	all A with R	*Universal restriction*
$\exists R.A$	R some A	R.some(A)	some A with R	*Existential restriction*
$= nR.A$	R exactly n A	R.exactly(n, A)		*Cardinality restriction*
$\leq nR.A$	R min n A	R.min(n, A)		*Minimum cardinality restriction*
$\geq nR.A$	R max n A	R.max(n, A)		*Minimum cardinality restriction*
$\exists R\{a\}$	R value a	R.value(a)		*Value restriction*
Decompositions				
$A \sqcup B \sqsubseteq \bot$	A disjoint with B	AllDisjoint([A, B])	A disjoint with B	Disjoint
		B in A.disjoints()		Test for disjointness
$\exists R.\top \sqsubseteq A$	R domain A	R.domain = [A]		Classes that the restriction applies to
$\top \sqsubseteq \forall R.B$	R range B	R.range = [B]		All classes that can be the value of the restriction

Examples

Here are some examples of different class descriptions using both the DL and Manchester notation.

Equivalence (`owl:equivalentTo`)

Equivalence ($\equiv$) defines necessary and sufficient conditions.

Parent is equivalent to mother or father

DL: `parent` $\equiv$ `mother` $\vee$ `father`

Manchester: `parent equivalent_to mother or father`

Inclusion (`rdf:subclassOf`)

Inclusion ($\sqsubseteq$) defines necessary conditions.

An employee is a person.

DL: `employee` $\sqsubseteq$ `person`

Manchester: `employee is_a person`

Enumeration (`owl:oneOf`)

The color of a wine is either white, rose or red:

DL: `wine_color` $\equiv$ {`white`, `rose`, `red`}

Manchester: `wine_color equivalent_to {white, rose, red}`

Existential restriction (`owl:someValuesFrom`)

A mother is a woman that has a child (some person):

DL: `mother` $\equiv$ `woman` $\sqcap \exists$`has_child`.`person`

Manchester: `mother equivalent_to woman and has_child some person`

Universal restriction (`owl:allValuesFrom`)

All parents that only have daughters:

DL: `parents_with_only_daughters` $\equiv$ `person` $\sqcap \forall$`has_child`.`woman`

Manchester: `parents_with_only_daughters equivalent_to person and has_child only woman`

Value restriction (`owl:hasValue`)

The owl:hasValue restriction allows to define classes based on the existence of particular property values. There must be at least one matching property value.

All children of Mary:

DL: `Marys_children` $\equiv$ `person` $\sqcap \exists$`has_parent`.{`Mary`}

Manchester: `Marys_children equivalent_to person and has_parent value Mary`

Property cardinality (`owl:cardinality`)

The owl:cardinality restrictions ($\geq$, $\leq$ or $\equiv$) allow to define classes based on the maximum (owl:maxCardinality), minimum (owl:minCardinality) or exact (owl:cardinality) number of occurences.

A person with one parent:

DL: `half_orphant` $\equiv$ `person` and $=1$`has_parent`.`person`

Manchester: `half_orphant equivalent_to person and has_parent exactly 1 person`

Intersection (`owl:intersectionOf`)

Individuals of the intersection ($\sqcap$) of two classes, are simultaneously instances of both classes.

A man is a person that is male:

DL: `man` $\equiv$ `person` $\sqcap$ `male`

Manchester: `man equivalent_to person and male`

Union (`owl:unionOf`)

Individuals of the union ($\sqcup$) of two classes, are either instances of one or both classes.

A person is a man or woman:

DL: `person` $\equiv$ `man` $\sqcup$ `woman`

Manchester: `person equivalent_to man or woman`

Complement (`owl:complementOf`)

Individuals of the complement ($\neg$) of a class, are all individuals that are not member of the class.

Not a man:

DL: `female` $\equiv \neg$ `male`

Manchester: `female equivalent_to not male`

The structure of EMMO

The EMMO ontology is structured in shells, expressed by specific ontology fragments, that extends from fundamental concepts to the application domains, following the dependency flow.

Top Level

The EMMO top level is the group of fundamental axioms that constitute the philosophical foundation of the EMMO. Adopting a physicalistic/nominalistic perspective, the EMMO defines real world objects as 4D objects that are always extended in space and time (i.e. real world objects cannot be spaceless nor timeless). For this reason abstract objects, i.e. objects that does not extend in space and time, are forbidden in the EMMO.

EMMO is strongly based on the analytical philosophy dicipline semiotic. The role of abstract objects are in EMMO fulfilled by semiotic objects, i.e. real world objects (e.g. symbol or sign) that stand for other real world objects that are to be interpreted by an agent. These symbols appear in actions (semiotic processes) meant to communicate meaning by establishing relationships between symbols (signs).

Another important building block of from analytical philosophy is atomistic mereology applied to 4D objects. The EMMO calls it 'quantum mereology', since the there is a epistemological limit to how fine we can resolve space and time due to the uncertainty principles.

The mereotopology module introduces the fundamental mereotopological concepts and their relations with the real world objects that they represent. The EMMO uses mereotopology as the ground for all the subsequent ontology modules. The concept of topological connection is used to define the first distinction between ontology entities namely the *Item* and *Collection* classes. Items are causally self-connected objects, while collections are causally disconnected. Quantum mereology is represented by the *Quantum* class. This module introduces also the fundamental mereotopological relations used to distinguish between space and time dimensions.

The physical module, defines the *Physical* objects and the concept of *Void* that plays a fundamental role in the description of multiscale objects and quantum systems. It also define the *Elementary* class, that restricts mereological atomism in space.

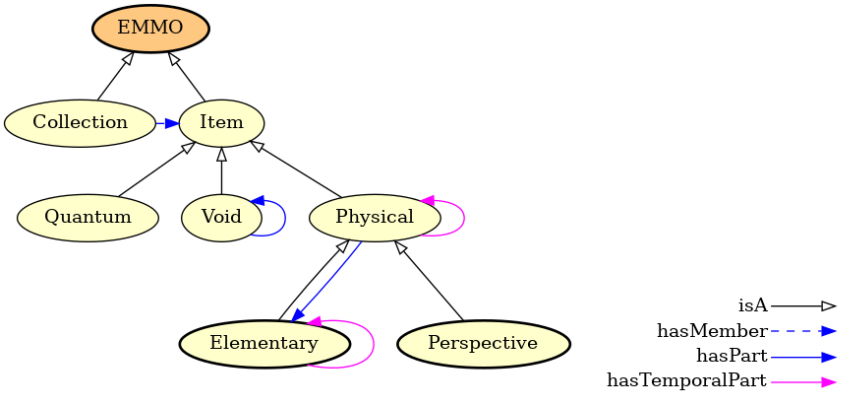


Figure 1.7: The EMMO top level.

In EMMO, the only univocally defined real world object is the *Item* individual called **Universe** that stands for the universe. Every other real world object is a composition of elementaries up to the most comprehensive object; the **Universe**. Intermediate objects are not univocally defined, but their definition is provided according to some specific philosophical perspectives. This is an expression of reductionism (i.e. objects are made of sub-objects) and epistemological pluralism (i.e. objects are always defined according to the perspective of an interpreter, or a class of interpreters).

The *Perspective* class collects the different ways to represent the objects that populate the conceptual region between the elementary and universe levels.

Middle Level

The middle level ontologies act as roots for extending the EMMO towards specific application domains.

The *Reductionistic* perspective class uses the fundamental non-transitive parthood relation, called direct parthood, to provide a powerful granularity description of multiscale real world objects. The EMMO can in principle represents the **Universe** with direct parthood relations as a direct rooted tree up to its elementary constituents.

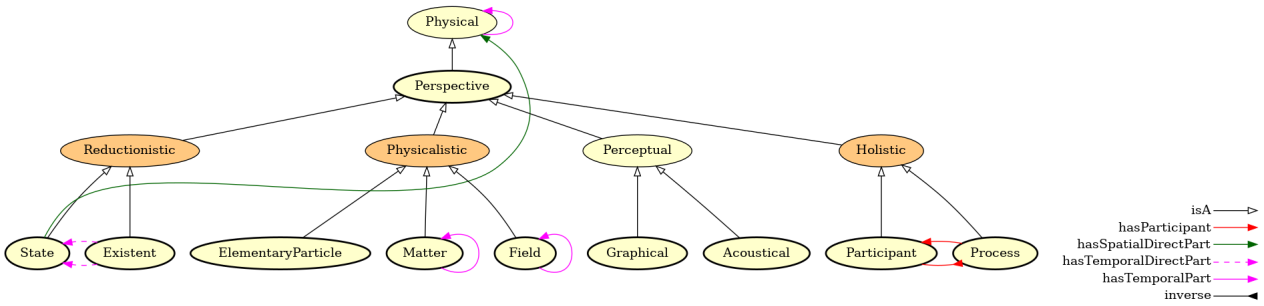


Figure 1.8: The EMMO perspectives.

The *Phenomenic* perspective class introduces the concept of real world objects that express of a recognisable pattern in space or time that impress the user. Under this class the EMMO categorises e.g. formal languages, pictures, geometry, mathematics and sounds. Phenomenic objects can be used in a semiotic process as signs.

The *Physicalistic* perspective class introduces the concept of real world objects that have a meaning for the under applied physics perspective.

The *Holistic* perspective class introduces the concept of real world objects that unfold in time in a way that has a meaning for the EMMO user, through the definition of the classes *Process* and *Participant*. The semiotics module introduces the concepts of semiotics and the *Semiosis* process that has a *Sign*, an *Object* and an *Interpreter* as participants. This forms the basis in EMMO to represent e.g. models, formal languages, theories, information and properties.

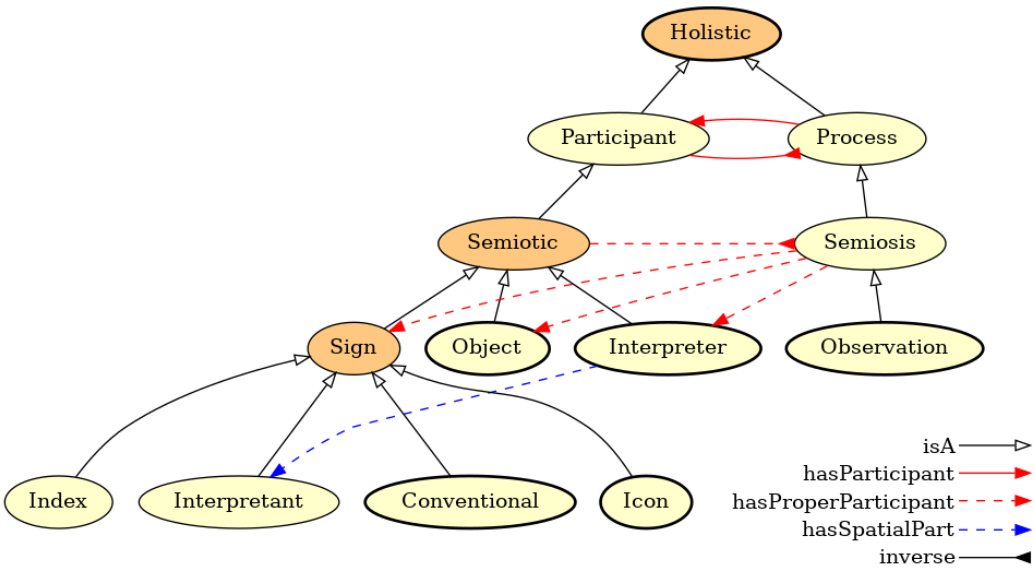


Figure 1.9: The semiotic level, showing both the taxonomy (open black arrows) and other relations as listed in the caption. The inverted arrows corresponds to inverse relations.

EMMO relations

All EMMO relations are subrelations of the relations found in the two roots: *mereotopological* and *semiotical*. The relation hierarchy extends more vertically (i.e. more subrelations) than horizontally (i.e. less sibling relations), facilitating the categorisation and inferencing of individuals. See also the chapter EMMO Relations.

Imposing all relations to fall under mereotopology or semiotics is how the EMMO force the developers to respect its perspectives. Two entities are related only by contact or parthood (mereotopology) or by standing one for another (semiosis): no other types of relation are possible within the EMMO.

A unique feature in EMMO, is the introduction of *direct parthood*. As illustrated in the figure below, it is a mereological relation that lacks transitivity. This makes it possible to entities made of parts at different levels of granularity and to go between granularity levels in a well-defined manner. This is paramount for cross scale

interoperability. Every material in EMMO is placed on a granularity level and the ontology gives information about the direct upper and direct lower level classes using the non-transitive direct parthood relations.

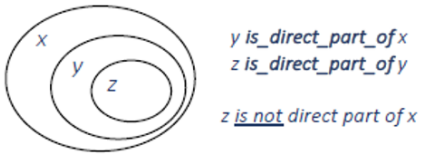


Figure 1.10: Direct parthood.

Annotations

All entities and relations in EMMO have some attributes, called *annotations*. In some cases, only the required *International Resource Identifier* (IRI) and *relations* are provided. However, descriptive annotations, like *elucidation* and *comment*, are planned to be added for all classes and relations. Possible annotations are:

- **Elucidation** is a human readable explanation and clearification of the documented class or relation.
- **Example** clearifies the elucidation through an example. A class may have several examples, each addressing different aspects.
- **Comment** is a clearifying note complementing the definition and elucidation. A class may have several comments, each clearifying different aspects.
- **IRI** stands for *international resource identifier*. It is an identifier that uniquely identifies the class or relation. IRIs are similar to URIs, but are not restricted to the ASCII character set. In EMMO, the IRIs are now valid URLs pointing to the stable version of EMMO.
- **Relations** is a list of relations applying to the current class or relation. The relations for relations are special and will be elaborated on in the introduction to chapter [Relations]. Some of the listed relations are defined in the OWL sources, while other are inferred by the reasoner. The relations are expressed using the Manchester OWL syntax introduced in section Description logic.

Chapter 2

EMMO Relations

In the language of OWL, relations are called *properties*. However, since relations describe relations between classes and individuals and since properties has an other meaning in EMMO, we only call them *relations*.

Resource Description Framework (RDF) is a W3C standard that is widely used for describing informations on the web and is one of the standards that OWL builds on. RDF expresses information in form of *subject-predicate-object* triplets. The subject and object are resources (aka items to describe) and the predicate expresses a relationship between the subject and the object.

In OWL are the subject and object classes or individuals (or data) while the predicate is a relation. An example of an relationship is the statement *dog is_a animal*. Here `dog` is the subject, `is_a` the predicate and `animal` the object.

OWL distingues between *object properties*, that link classes or individuals to classes or individuals, and *data properties* that link individuals to data values. Since EMMO only deals with classes, we will only be discussing object properties. However, in actual simulation or characterisation applications build on EMMO, datatype propertyes will be important.

The characteristics of the different properties are described by the following *property axioms*:

- `rdf:subPropertyOf` is used to define that a property is a subproperty of some other property. For instance, in the figure below showing the relation branch, we see that `active_relation` is a subproperty or `relation`. The `rdf:subPropertyOf` axioms forms a taxonomy-like tree for relations.
- `owl:equivalentProperty` states that two properties have the same property extension.
- `owl:inverseOf` axioms relate active relations to their corresponding passive relations, and vice versa. The root relation `relation` is its own inverse.
- `owl:FunctionalProperty` is a property that can have only one (unique) value y for each instance x, i.e. there cannot be two distinct values y1 and y2 such that the pairs (x,y1) and (x,y2) are both instances of this property. Both object properties and datatype properties can be declared as "functional".
- `owl:InverseFunctionalProperty`
- `owl:TransitiveProperty` states that if a pair (x,y) is an instance of P, and the pair (y,z) is instance of P, then we can infer that the pair (x,z) is also an instance of P.
- `owl:SymmetricProperty` states that if the pair (x,y) is an instance of P, then the pair (y,x) is also an instance of P. A popular example of a symmetric property is the `siblingOf` relation.
- `rdfs:domain` specifies which classes the property applies to. Or said differently, the valid values of the *subject* in a *subject-predicate-object* triplet.
- `rdfs:range` specifies the property extension, i.e. the valid values of the *object* in a *subject-predicate-object* triplet.

Root of EMMO relations

EMMORelation

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_ec2472ae_cf4a_46a5_8555_1556f5a6c3c5

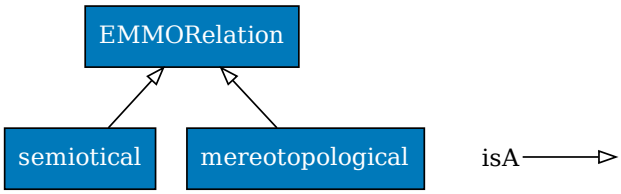


Figure 2.1: Top-level of the EMMO relation hierarchy.

Elucidation: The superclass for all relations used by the EMMO.

Preflabel: EMMORelation

Relations:

- is_a owl:ObjectProperty
- is_a owl:SymmetricProperty
- is_a owl:TransitiveProperty
- is_a owl:topObjectProperty
- equivalent_to Inverse(mereotopology.EMMORelation)
- inverse_of mereotopology.EMMORelation
- domain mereotopology.EMMO
- range mereotopology.EMMO

Mereotopological branch

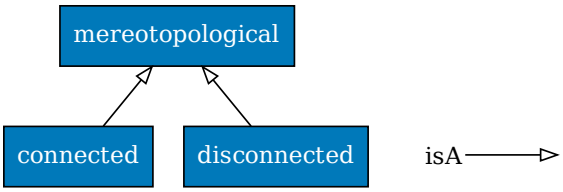


Figure 2.2: Mereotopological branch.

disconnected

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_517dfaf9_4970_41ac_81ee_d031627d2c7c

Preflabel: disconnected

Relations:

- is_a owl:ObjectProperty
- is_a owl:SymmetricProperty
- is_a mereotopology.mereotopological
- Inverse(mereotopology.mereotopological)
- equivalent_to Inverse(mereotopology.disconnected)
- inverse_of mereotopology.disconnected

mereotopological

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_03212fd7_abfd_4828_9c8e_62c293052d4b

Elucidation: The superclass for all EMMO mereotopological relations.

Preflabel: mereotopological

Relations:

- is_a owl:ObjectProperty
- is_a owl:SymmetricProperty
- is_a owl:TransitiveProperty
- is_a mereotopology.EMMORelation
- Inverse(mereotopology.EMMORelation)
- equivalent_to Inverse(mereotopology.mereotopological)
- inverse_of mereotopology.mereotopological

Connected branch

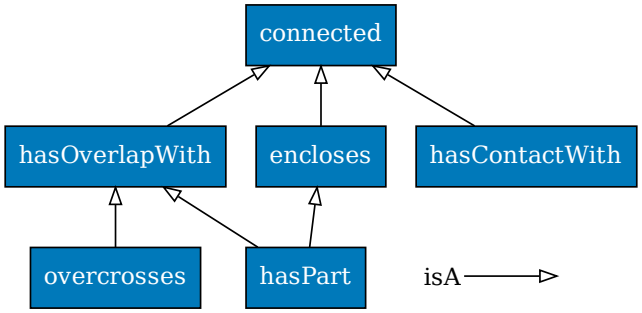


Figure 2.3: Connected branch.

hasOverlapWith

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_d893d373_b579_4867_841e_1c2b31a8d2c6

Preflabel: hasOverlapWith

Relations:

- is_a owl:ObjectProperty
- is_a owl:SymmetricProperty
- is_a mereotopology.connected
- Inverse(mereotopology.connected)
- equivalent_to Inverse(mereotopology.hasOverlapWith)
- inverse_of mereotopology.hasOverlapWith

overcrosses

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_9cb984ca_48ad_4864_b09e_50d3fff19420

Preflabel: overcrosses

Relations:

- is_a owl:ObjectProperty
- is_a owl:SymmetricProperty
- is_a mereotopology.hasOverlapWith
- Inverse(mereotopology.hasOverlapWith)
- equivalent_to Inverse(mereotopology.overcrosses)
- inverse_of mereotopology.overcrosses

connected

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_6703954e_34c4_4a15_a9e7_f313760ae1a8

Preflabel: connected

Relations:

- is_a owl:ObjectProperty
- is_a owl:SymmetricProperty
- is_a mereotopology.mereotopological
- Inverse(mereotopology.mereotopological)
- equivalent_to Inverse(mereotopology.connected)
- inverse_of mereotopology.connected

encloses

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_8c898653_1118_4682_9bbf_6cc334d16a99

Preflabel: encloses

Relations:

- is_a owl:ObjectProperty
- is_a owl:TransitiveProperty
- is_a mereotopology.connected
- Inverse(mereotopology.connected)

hasContactWith

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_4d6504f1_c470_4ce9_b941_bbbebc9ab05d

Preflabel: hasContactWith

Relations:

- is_a owl:ObjectProperty
- is_a owl:SymmetricProperty
- is_a mereotopology.connected
- Inverse(mereotopology.connected)
- equivalent_to Inverse(mereotopology.hasContactWith)
- inverse_of mereotopology.hasContactWith

Has Part branch

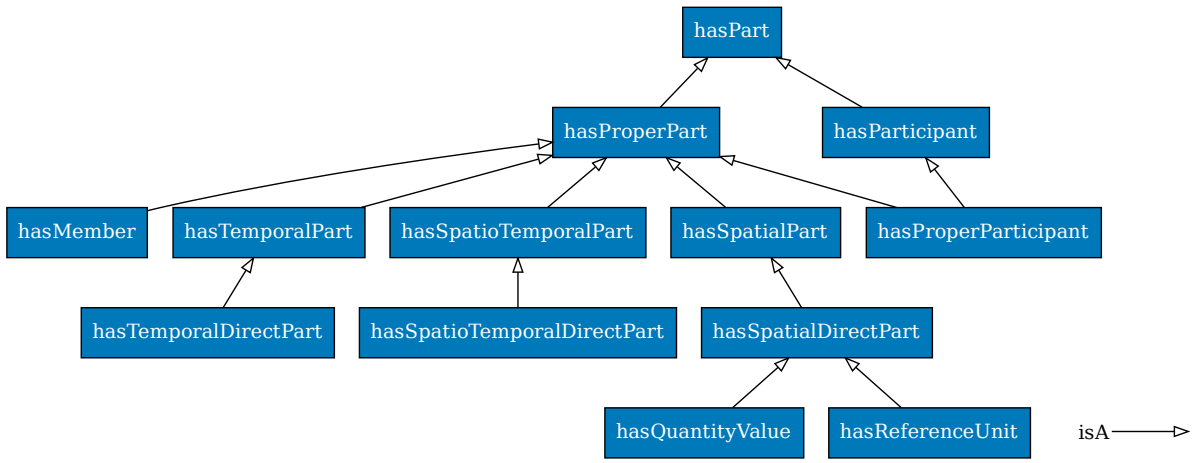


Figure 2.4: Has Part branch.

hasParticipant

IRI: http://emmo.info/emmo/middle/holistic#EMMO_ae2d1a96_bfa1_409a_a7d2_03d69e8a125a

Elucidation: The relation between a process and an object participating to it.

Preflabel: hasParticipant

Relations:

- is_a owl:ObjectProperty
- is_a mereotopology.hasPart
- domain holistic.Process
- range holistic.Participant

hasMember

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_6b7276a4_4b9d_440a_b577_0277539c0fc4

Preflabel: hasMember

Relations:

- is_a owl:ObjectProperty
- is_a owl:AsymmetricProperty
- is_a owl:IrreflexiveProperty
- is_a mereotopology.hasProperPart
- domain mereotopology.Collection
- range mereotopology.Item

hasTemporalDirectPart

IRI: http://emmo.info/emmo/middle/reductionistic#EMMO_65a2c5b8_e4d8_4a51_b2f8_e55effc0547d

Preflabel: hasTemporalDirectPart

Relations:

- is_a owl:ObjectProperty
- is_a owl:InverseFunctionalProperty
- is_a owl:AsymmetricProperty
- is_a owl:IrreflexiveProperty
- is_a physical.hasTemporalPart
- domain reductionistic.Existent
- range reductionistic.State

hasTemporalPart

IRI: http://emmo.info/emmo/top/physical#EMMO_7afbed84_7593_4a23_bd88_9d9c6b04e8f6

Elucidation: A relation that isolate a proper part that covers the total spatial extension of a whole within a time interval.

Preflabel: hasTemporalPart

Relations:

- is_a owl:ObjectProperty
- is_a owl:TransitiveProperty
- is_a mereotopology.hasProperPart
- domain mereotopology.Item
- range mereotopology.Item

hasSpatioTemporalDirectPart

IRI: http://emmo.info/emmo/middle/reductionistic#EMMO_663859e5_add3_4c9e_96fb_c99399de278d

Preflabel: hasSpatioTemporalDirectPart

Relations:

- is_a owl:ObjectProperty
- is_a owl:InverseFunctionalProperty
- is_a owl:AsymmetricProperty
- is_a owl:IrreflexiveProperty
- is_a physical.hasSpatioTemporalPart

hasPart

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_17e27c22_37e1_468c_9dd7_95e137f73e7f

Preflabel: hasPart

Relations:

- is_a owl:ObjectProperty
- is_a owl:TransitiveProperty
- is_a mereotopology.encloses
- is_a mereotopology.hasOverlapWith
- Inverse(mereotopology.hasOverlapWith)

hasQuantityValue

IRI: http://emmo.info/emmo/middle/metrology#EMMO_8ef3cd6d_ae58_4a8d_9fc0_ad8f49015cd0

Preflabel: hasQuantityValue

Relations:

- is_a owl:ObjectProperty
- is_a owl:InverseFunctionalProperty
- is_a owl:AsymmetricProperty
- is_a owl:IrreflexiveProperty
- is_a reductionistic.hasSpatialDirectPart
- domain metrology.Quantity
- range math.Numerical

hasProperParticipant

IRI: http://emmo.info/emmo/middle/holistic#EMMO_c5aae418_1622_4d02_93c5_21159e28e6c1

Preflabel: hasProperParticipant

Relations:

- is_a owl:ObjectProperty
- is_a holistic.hasParticipant
- is_a mereotopology.hasProperPart

hasSpatioTemporalPart

IRI: http://emmo.info/emmo/top/physical#EMMO_6e046dd0_9634_4013_b2b1_9cc468087c83

Elucidation: A relation that isolates a proper part that extends itself in time through a portion of the lifetime whole.

Preflabel: hasSpatioTemporalPart

Relations:

- is_a owl:ObjectProperty
- is_a owl:TransitiveProperty
- is_a mereotopology.hasProperPart
- domain mereotopology.Item
- range mereotopology.Item

hasSpatialPart

IRI: http://emmo.info/emmo/top/physical#EMMO_f68030be_94b8_4c61_a161_886468558054

Elucidation: A relation that isolates a proper part that extends itself in time within the overall lifetime of the whole, without covering the full spatial extension of the 4D whole (i.e. is not a temporal part).

Preflabel: hasSpatialPart

Relations:

- is_a owl:ObjectProperty
- is_a owl:TransitiveProperty
- is_a mereotopology.hasProperPart
- domain mereotopology.Item
- range mereotopology.Item

hasProperPart

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_9380ab64_0363_4804_b13f_3a8a94119a76

Preflabel: hasProperPart

Relations:

- is_a owl:ObjectProperty
- is_a owl:TransitiveProperty
- is_a mereotopology.hasPart

hasSpatialDirectPart

IRI: http://emmo.info/emmo/middle/reductionistic#EMMO_b2282816_b7a3_44c6_b2cb_3feff1ceb7fe

Preflabel: hasSpatialDirectPart

Relations:

- is_a owl:ObjectProperty
- is_a owl:InverseFunctionalProperty
- is_a owl:AsymmetricProperty
- is_a owl:IrreflexiveProperty
- is_a physical.hasSpatialPart
- domain reductionistic.State

hasReferenceUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_67fc0a36_8dcb_4ffa_9a43_31074efa3296

Preflabel: hasReferenceUnit

Relations:

- is_a owl:ObjectProperty
- is_a owl:InverseFunctionalProperty
- is_a owl:AsymmetricProperty
- is_a owl:IrreflexiveProperty
- is_a reductionistic.hasSpatialDirectPart
- domain metrology.Quantity
- range metrology.ReferenceUnit

Semiotical branch

hasProperty

IRI: http://emmo.info/emmo/middle/properties#EMMO_e1097637_70d2_4895_973f_2396f04fa204

Preflabel: hasProperty

Relations:

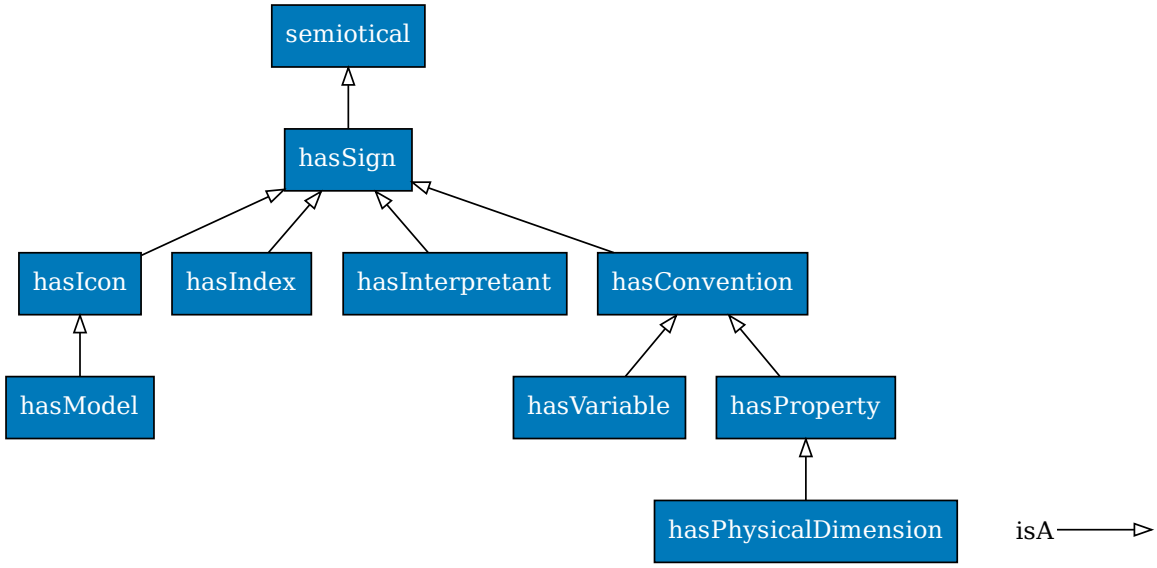


Figure 2.5: Semiotical branch.

- is_a owl:ObjectProperty
- is_a semiotics.hasConvention
- domain semiotics.Object
- range properties.Property

hasPhysicalDimension

IRI: http://emmo.info/emmo/middle/metrology#EMMO_bed1d005_b04e_4a90_94cf_02bc678a8569

Preflabel: hasPhysicalDimension

Relations:

- is_a owl:ObjectProperty
- is_a properties.hasProperty
- range metrology.PhysicalDimension

hasIcon

IRI: http://emmo.info/emmo/middle/semiotics#EMMO_39c3815d_8cae_4c8f_b2ff_eeba24bec455

Preflabel: hasIcon

Relations:

- is_a owl:ObjectProperty
- is_a semiotics.hasSign
- range semiotics.Icon

hasIndex

IRI: http://emmo.info/emmo/middle/semiotics#EMMO_297999d6_c9e4_4262_9536_bd524d1c6e21

Preflabel: hasIndex

Relations:

- is_a owl:ObjectProperty
- is_a semiotics.hasSign
- range semiotics.Index

hasInterpretant

IRI: http://emmo.info/emmo/middle/semiotics#EMMO_7fb7fe7e_bdf9_4eeb_adad_e384dd5285c6

Preflabel: hasInterpretant

Relations:

- is_a owl:ObjectProperty
- is_a semiotics.hasSign
- range semiotics.Interpretant

hasVariable

IRI: http://emmo.info/emmo/middle/math#EMMO_3446e167_c576_49d6_846c_215bb8878a55

Preflabel: hasVariable

Relations:

- is_a owl:ObjectProperty
- is_a semiotics.hasConvention
- domain math.Mathematical
- range math.Variable

hasModel

IRI: http://emmo.info/emmo/middle/models#EMMO_24c71baf_6db6_48b9_86c8_8c70cf36db0c

Preflabel: hasModel

Relations:

- is_a owl:ObjectProperty
- is_a semiotics.hasIcon

semiotical

IRI: http://emmo.info/emmo/middle/semiotics#EMMO_2337e25c_3c60_43fc_a8f9_b11a3f974291

Elucidation: The generic EMMO semiotical relation.

Preflabel: semiotical

Relations:

- is_a owl:ObjectProperty
- is_a mereotopology.EMMORelation
- Inverse(mereotopology.EMMORelation)

hasConvention

IRI: http://emmo.info/emmo/middle/semiotics#EMMO_eb3518bf_f799_4f9e_8c3e_ce59af11453b

Preflabel: hasConvention

Relations:

- is_a owl:ObjectProperty
- is_a semiotics.hasSign
- range semiotics.Conventional

hasSign

IRI: http://emmo.info/emmo/middle/semiotics#EMMO_60577dea_9019_4537_ac41_80b0fb563d41

Preflabel: hasSign

Relations:

- is_a owl:ObjectProperty

- is_a semiotics.semiotical
- domain semiotics.Object
- range semiotics.Sign

Chapter 3

EMMO Classes

emmo is a class representing the collection of all the individuals (signs) that are used in the ontology. Individuals are declared by the EMMO users when they want to apply the EMMO to represent the world.

EMMO branch

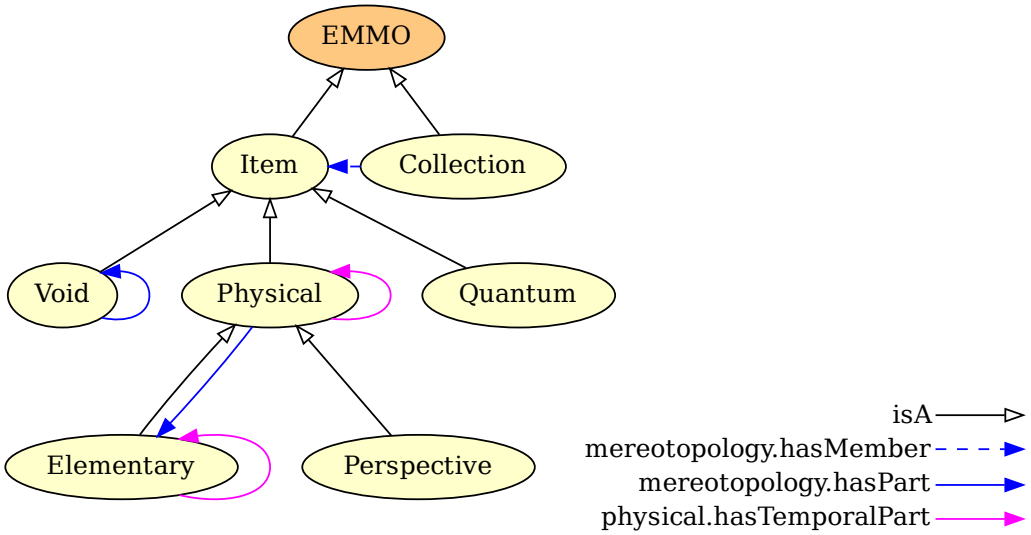


Figure 3.1: EMMO branch.

The root of all classes used to represent the world. It has two children; *collection* and *item*.

collection is the class representing the collection of all the individuals (signs) that represents a collection of non-connected real world objects.

item Is the class that collects all the individuals that are members of a set (it's the most comprehensive set individual). It is the branch of mereotopology.

Quantum

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_3f9ae00e_810c_4518_aec2_7200e424cf68

Elucidation: The class of 'EMMO' individuals that stand for real world objects that can't be further divided in time nor in space.

Example: For a physics based ontology the 'Quantum' can stand for the smallest identifiable portion of spacetime defined by the Planck limit in length (1.616e-35 m) and time (5.39e-44 s).

However, the quantum mereotopology approach is not restricted only to physics. For example, in a manpower management ontology, a 'Quantum' can stand for an hour (time) of a worker (space) activity.

Preflabel: Quantum

Relations:

- is_a mereotopology.Item
- is_a mereotopology.EMMO
- mereotopology.hasProperPart only owl:Nothing

Collection

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_2d2ecd97_067f_4d0e_950c_d746b7700a31

Elucidation: The class of all individuals that stand for a real world not self-connected object.

Preflabel: Collection

Relations:

- is_a mereotopology.EMMO
- mereotopology.hasMember some mereotopology.Item

Void

IRI: http://emmo.info/emmo/top/physical#EMMO_29072ec4_ffcb_42fb_bdc7_26f05a2e9873

Elucidation: A 'Item' that has no 'Physical' parts.

Preflabel: Void

Relations:

- is_a mereotopology.Item
- mereotopology.hasPart only physical.Void

Item

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_eb3a768e_d53e_4be9_a23b_0714833c36de

Preflabel: Item

Relations:

- is_a mereotopology.EMMO
- disjoint_union_of physical.Void, physical.Physical

Physical

IRI: http://emmo.info/emmo/top/physical#EMMO_c5ddfdba_c074_4aa4_ad6b_1ac4942d300d

Elucidation: A 'Item' that has part some 'Elementary' and whose temporal proper parts are only 'Physical'-s (i.e. it can be perceived without interruptions in time).

Preflabel: Physical

Relations:

- is_a mereotopology.Item
- mereotopology.hasPart some physical.Elementary
- physical.hasTemporalPart only physical.Physical

Individuals:

- mereotopology.Universe

EMMO

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_802d3e92_8770_4f98_a289_ccaaab7fdddf

Elucidation: The class representing the collection of all the individuals declared in this ontology standing for real world objects.

Preflabel: EMMO

Relations:

- is_a owl:Thing
- equivalent_to mereotopology.hasPart some mereotopology.Quantum
- equivalent_to Inverse(mereotopology.hasPart) value mereotopology.Universe
- disjoint_union_of mereotopology.Collection, mereotopology.Item

Elementary branch

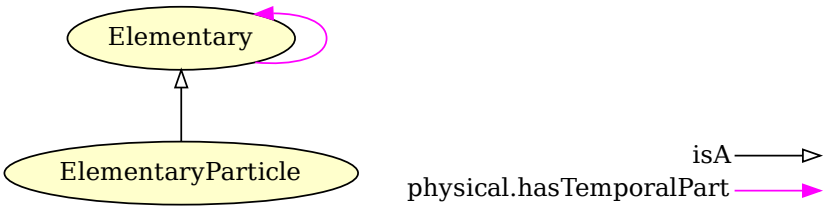


Figure 3.2: Elementary branch.

Elementary

IRI: http://emmo.info/emmo/top/physical#EMMO_0f795e3e_c602_4577_9a43_d5a231aa1360

Elucidation: The basic constituent of 'item'-s that can be proper partitioned only in time up to quantum level.

Preflabel: Elementary

Relations:

- is_a physical.Physical
- physical.hasTemporalPart only physical.Elementary
- physical.hasSpatialPart only owl:Nothing

Perspective branch

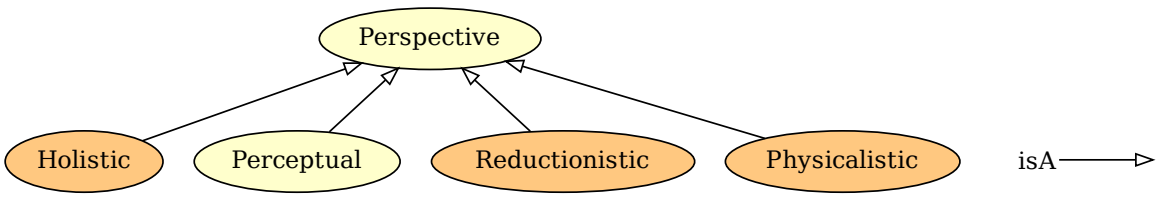


Figure 3.3: Perspective branch.

Perspective

IRI: http://emmo.info/emmo/top#EMMO_49267eba_5548_4163_8f36_518d65b583f9

Elucidation: The class of individuals that stand for real world objects according to a specific representational perspective.

Preflabel: Perspective

Relations:

- is_a physical.Physical

Holistic branch

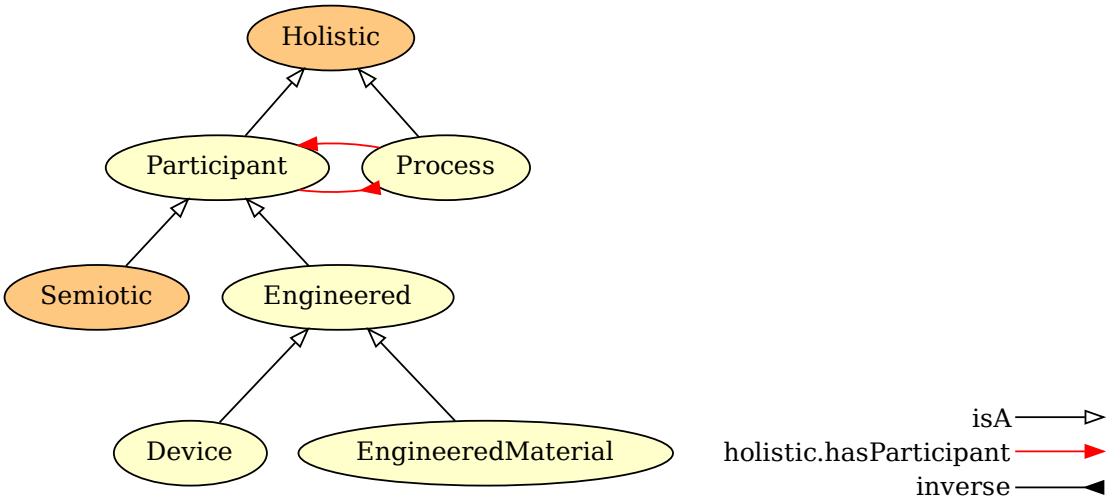


Figure 3.4: Holistic branch.

Holistic

IRI: http://emmo.info/emmo/middle/holistic#EMMO_0277f24a_ea7f_4917_81b7_fb0406c8fc62

Elucidation: A union of classes that categorize physicals under a holistic perspective: the interest is on the whole 4D object (process) and the role of its 4D parts (participants) without going further into specifying the spatial hierarchy or the temporal position of each part.

Preflabel: Holistic

Relations:

- is_a top.Perspective
- equivalent_to holistic.Process or holistic.Participant

Device

IRI: http://emmo.info/emmo/middle/manufacturing#EMMO_494b372c_cfdf_47d3_a4de_5e037c540de8

Elucidation: An engineered object which is instrumental for reaching a particular purpose through its characteristic functioning process, with particular reference to mechanical or electronic equipment.

Preflabel: Device

Relations:

- is_a manufacturing.Engineered
- Inverse(holistic.hasProperParticipant) some manufacturing.DiscreteManufacturing

Participant

IRI: http://emmo.info/emmo/middle/holistic#EMMO_49804605_c0fe_4538_abda_f70ba1dc8a5d

Elucidation: A portion of a 'Process' that participates to the process with a specific role.

Preflabel: Participant

Relations:

- is_a holistic.Holistic
- is_a physical.Physical
- Inverse(holistic.hasParticipant) some holistic.Process

EngineeredMaterial

IRI: http://emmo.info/emmo/middle/manufacturing#EMMO_ec7464a9_d99d_45f8_965b_4e9230ea8356

Preflabel: EngineeredMaterial

Relations:

- is_a manufacturing.Engineered
- is_a physicalistic.Material
- Inverse(holistic.hasProperParticipant) some manufacturing.ContinuumManufacturing

Engineered

IRI: http://emmo.info/emmo/middle/manufacturing#EMMO_86ca9b93_1183_4b65_81b8_c0fcd3bba5ad

Elucidation: A 'physical' that stands for a real world object that has been designed and manufactured for a particular purpose.

Example: Car, tire, composite material.

Preflabel: Engineered

Relations:

- is_a holistic.Participant
- Inverse(holistic.hasProperParticipant) some manufacturing.Manufacturing

Semiotic branch

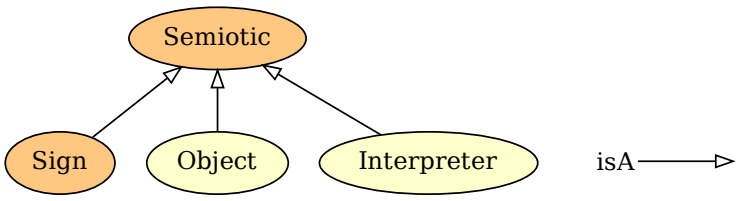


Figure 3.5: Semiotic branch.

Semiotic

IRI: http://emmo.info/emmo/middle/semiotics#EMMO_b803f122_4acb_4064_9d71_c1e5fd091fc9

Elucidation: The class of individuals that stands for semiotic objects, i.e. objects that take part on a semiotic process.

Preflabel: Semiotic

Relations:

- is_a holistic.Participant
- Inverse(holistic.hasProperParticipant) some semiotics.Semiosis
- equivalent_to semiotics.Interpreter or semiotics.Object or semiotics.Sign

Sign branch

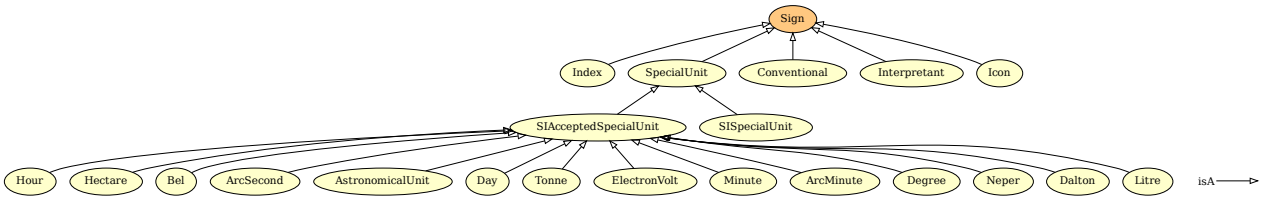


Figure 3.6: Sign branch.

Sign

IRI: http://emmo.info/emmo/middle/semiotics#EMMO_b21a56ed_f969_4612_a6ec_cb7766f7f31d

Elucidation: An 'Physical' that is used as sign ("semeion" in greek) that stands for another 'Physical' through an semiotic process.

Example: A novel is made of chapters, paragraphs, sentences, words and characters (in a direct parthood mereological hierarchy).

Each of them are 'sign'-s.

A character can be the a-tomistic 'sign' for the class of texts.

The horizontal segment in the character "A" is direct part of "A" but it is not a 'sign' itself.

For plain text we can propose the ASCII symbols, for math the fundamental math symbols.

Preflabel: Sign

Relations:

- is_a semiotics.Semiotic
- equivalent_to semiotics.Index or semiotics.Conventional or semiotics.Icon

Index

IRI: http://emmo.info/emmo/middle/semiotics#EMMO_0cd58641_824c_4851_907f_f4c3be76630c

Elucidation: A 'Sign' that stands for an 'Object' due to causal continguity.

Example: Smoke stands for a combustion process (a fire). My facial expression stands for my emotional status.

Preflabel: Index

Relations:

- is_a semiotics.Sign

SpecialUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_3ee80521_3c23_4dd1_935d_9d522614a3e2

Elucidation: A unit symbol that stands for a derived unit.

Example: Pa stands for N/m2 J stands for N m

Preflabel: SpecialUnit

Relations:

- is_a metrology.DerivedUnit

- is_a metrology.UnitSymbol
- is_a semiotics.Sign
- Inverse(semiotics.hasSign) some metrology.DerivedUnit

Hour

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_21ef2ed6_c086_4d24_8a75_980d2bcc9282

Definition: Measure of time defined as 3600 seconds.

Iupacentry: https://doi.org/10.1351/goldbook.H02866

Preflabel: Hour

Qudtentry: http://qudt.org/vocab/unit/HR

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.TimeDimension
- perceptual.hasSymbolData value “h”

SIAcceptedSpecialUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_6795a4b8_ffd0_4588_a581_a9413fe49cac

Elucidation: Non-SI units mentioned in the SI.

Preflabel: SIAcceptedSpecialUnit

Wikipediaentry: https://en.wikipedia.org/wiki/Non-SI_units_mentioned_in_the_SI

Relations:

- is_a metrology.SpecialUnit
- is_a metrology.OffSystemUnit
- disjoint_union_of units-extension.Dalton, units-extension.AstronomicalUnit, units-extension.ArcMinute, units-extension.Hour, units-extension.Day, units-extension.ArcSecond, units-extension.Bel, units-extension.Litre, units-extension.Neper, units-extension.Degree, units-extension.Minute, units-extension.Hectare, units-extension.ElectronVolt, units-extension.Tonne

Hectare

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_d6eb0176_a0d7_4b4e_8df0_50e912be2342

Definition: A non-SI metric unit of area defined as the square with 100-metre sides.

Dbpediaentry: http://dbpedia.org/page/Hectare

Preflabel: Hectare

Qudtentry: http://qudt.org/vocab/unit/HA

Wikipediaentry: https://en.wikipedia.org/wiki/Hectare

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.AreaDimension
- perceptual.hasSymbolData value “ha”

Bel

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_6c7160fc_cc64_46f0_b43b_aba65e9952e3

Definition: One bel is defined as ½ `ln(10) neper`.

Elucidation: Unit of measurement for quantities of type level or level difference.

Preflabel: Bel

Qudtentry: http://qudt.org/vocab/unit/B

Wikipediaentry: https://en.wikipedia.org/wiki/Decibel

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “B”

ArcSecond

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_6a4547ab_3abb_430d_b81b_ce32d47729f5

Definition: Measure of plane angle defined as 1/3600 or a degree.

Altlabel: SecondOfArc

Preflabel: ArcSecond

Qudtentry: http://qudt.org/vocab/unit/ARCSEC

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “ ”

AstronomicalUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_053648ea_3c0a_468c_89cb_eb009239323a

Definition: One astronomical unit is defined as exactly 149597870700 m, which is roughly the distance from earth to sun.

Dbpediaentry: http://dbpedia.org/page/Astronomical_unit

Preflabel: AstronomicalUnit

Qudtentry: http://qudt.org/vocab/unit/PARSEC

Wikipediaentry: https://en.wikipedia.org/wiki/Astronomical_unit

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.LengthDimension
- perceptual.hasSymbolData value “au”

Day

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_28ef05a7_ecc1_4df6_8116_c53251fbd4a8

Definition: A measure of time defined as 86 400 seconds.

Dbpediaentry: http://dbpedia.org/page/Day

Iupacentry: https://doi.org/10.1351/goldbook.D01527

Preflabel: Day

Qudtentry: http://qudt.org/vocab/unit/DAY

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.TimeDimension
- perceptual.hasSymbolData value “d”

Tonne

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_f8b92999_3cde_46e3_99d5_664da3090a02

Definition: A non-SI unit defined as 1000 kg.

Iupacentry: https://doi.org/10.1351/goldbook.T06394

Preflabel: Tonne

Qudtentry: http://qudt.org/vocab/unit/TON_M

Wikipediaentry: https://en.wikipedia.org/wiki/Tonne

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.MassDimension
- perceptual.hasSymbolData value “t”

ElectronVolt

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_e29f84db_4c1c_46ae_aa38_c4d47536b972

Definition: The amount of energy gained (or lost) by the charge of a single electron moving across an electric potential difference of one volt.

Dbpediaentry: http://dbpedia.org/page/Electronvolt

Iupacentry: https://doi.org/10.1351/goldbook.E02014

Preflabel: ElectronVolt

Qudtentry: http://qudt.org/vocab/unit/EV

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.EnergyDimension
- perceptual.hasSymbolData value “eV”

Minute

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_cabb20f0_05c7_448f_9485_e129725f15a4

Definition: Non-SI time unit defined as 60 seconds.

Dbpediaentry: http://dbpedia.org/page/Minute

Preflabel: Minute

Qudtentry: http://qudt.org/vocab/unit/MIN

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.TimeDimension
- perceptual.hasSymbolData value “min”

ArcMinute

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_1e0b665d_db6c_4752_a6d4_262d3a8dbb46

Definition: Measure of plane angle defined as 1/60 or a degree.

Altlabel: MinuteOfArc

Preflabel: ArcMinute

Qudtentry: http://qudt.org/vocab/unit/ARCMIN

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “ ”

Degree

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_b8830065_3809_41b7_be3c_e33795567fd9

Definition: Degree is a measurement of plane angle, defined by representing a full rotation as 360 degrees.

Dbpediaentry: http://dbpedia.org/page/Degree_(angle)

Iupacentry: https://doi.org/10.1351/goldbook.D01560

Preflabel: Degree

Qudtentry: http://qudt.org/vocab/unit/DEG

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “°”

Neper

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_b41515a9_28d8_4d78_8165_74b2fc72f89e

Definition: Unit of measurement for quantities of type level or level difference, which are defined as the natural logarithm of the ratio of power- or field-type quantities.

The value of a ratio in nepers is given by `ln(x1/x2)` where `x1` and `x2` are the values of interest (amplitudes), and ln is the natural logarithm. When the values are quadratic in the amplitude (e.g. power), they are first linearised by taking the square root before the logarithm is taken, or equivalently the result is halved.

Wikipedia

Dbpediaentry: http://dbpedia.org/page/Neper

Iupacentry: https://doi.org/10.1351/goldbook.N04106

Preflabel: Neper

Qudtentry: http://qudt.org/vocab/unit/NP

Wikipediaentry: https://en.wikipedia.org/wiki/Neper

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “Np”

Dalton

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_00dd79e0_31a6_427e_9b9c_90f3097e4a96

Definition: One dalton is defined as one twelfth of the mass of an unbound neutral atom of carbon-12 in its nuclear and electronic ground state.

Dbpediaentry: http://dbpedia.org/page/Unified_atomic_mass_unit

Iupacentry: https://doi.org/10.1351/goldbook.D01514

Preflabel: Dalton

Qudtentry: http://qudt.org/vocab/unit/Dalton

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.MassDimension
- perceptual.hasSymbolData value “Da”

Litre

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_a155dc93_d266_487e_b5e7_2a2c72d5ebf9

Definition: A non-SI unit of volume defined as 1 cubic decimetre (dm3),

Iupacentry: https://doi.org/10.1351/goldbook.L03594

Preflabel: Litre

Qudtentry: http://qudt.org/vocab/unit/L

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.VolumeDimension
- perceptual.hasSymbolData value “l”

Interpretant

IRI: http://emmo.info/emmo/middle/semiotics#EMMO_054af807_85cd_4a13_8eba_119dfdaaf38b

Elucidation: The interpreter’s internal representation of the object in a semiosis process.

Preflabel: Interpretant

Relations:

- is_a semiotics.Sign

Interpreter branch

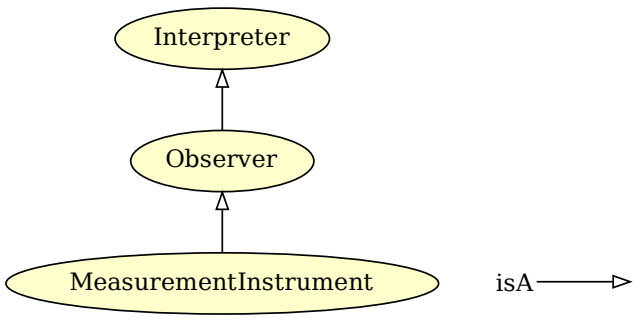


Figure 3.7: Interpreter branch.

Observer

IRI: http://emmo.info/emmo/middle/properties#EMMO_1b52ee70_121e_4d8d_8419_3f97cd0bd89c

Elucidation: An ‘interpreter’ that perceives another ‘entity’ (the ‘object’) through a specific perception mechanism and produces a ‘property’ (the ‘sign’) that stands for the result of that particular perception.

Preflabel: Observer

Relations:

- is_a semiotics.Interpreter
- Inverse(holistic.hasParticipant) some properties.Observation

Interpreter

IRI: http://emmo.info/emmo/middle/semiotics#EMMO_0527413c_b286_4e9c_b2d0_03fb2a038dee

Elucidation: The entity (or agent, or observer, or cognitive entity) who connects 'Sign', 'Interpretant' and 'Object'.

Preflabel: Interpreter

Relations:

- is_a semiotics.Semiotic
- physical.hasSpatialPart some semiotics.Interpretant

MeasurementInstrument

IRI: http://emmo.info/emmo/middle/properties#EMMO_f2d5d3ad_2e00_417f_8849_686f3988d929

Preflabel: MeasurementInstrument

Relations:

- is_a properties.Observer

Object branch

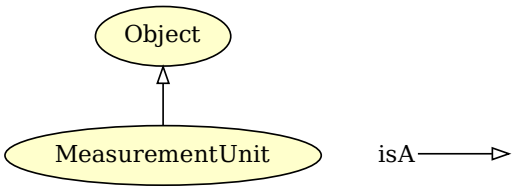


Figure 3.8: Object branch.

Object

IRI: http://emmo.info/emmo/middle/semiotics#EMMO_6f5af708_f825_4feb_a0d1_a8d813d3022b

Elucidation: The object, in Peirce semiotics.

Preflabel: Object

Relations:

- is_a semiotics.Semiotic

Conventional branch

MaterialLaw

IRI: http://emmo.info/emmo/middle/models#EMMO_f19ff3b4_6bfe_4c41_a2b2_9affd39c140b

Preflabel: MaterialLaw

Relations:

- is_a models.NaturalLaw

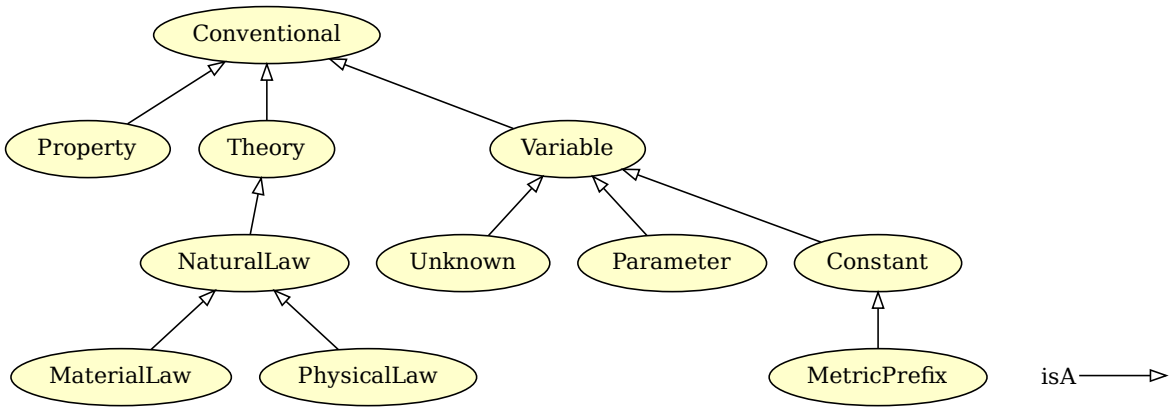


Figure 3.9: Conventional branch.

Unknown

IRI: http://emmo.info/emmo/middle/math#EMMO_fe7e56ce_118b_4243_9aad_20eb9f4f31f6

Elucidation: The dependent variable for which an equation has been written.

Example: Velocity, for the Navier-Stokes equation.

Preflabel: Unknown

Relations:

- is_a math.Variable

Parameter

IRI: http://emmo.info/emmo/middle/math#EMMO_d1d436e7_72fc_49cd_863b_7bfb4ba5276a

Example: viscosity in the Navier-Stokes equation

Preflabel: Parameter

Relations:

- is_a math.Variable

PhysicalLaw

IRI: http://emmo.info/emmo/middle/models#EMMO_9c32fd69_f480_4130_83b3_fb25d9face14

Preflabel: PhysicalLaw

Relations:

- is_a models.NaturalLaw

Variable

IRI: http://emmo.info/emmo/middle/math#EMMO_1eed0732_e3f1_4b2c_a9c4_b4e75eeb5895

Elucidation: A 'Variable' is a symbolic object that stands for a numerical defined 'Mathematical' object like e.g. a number, a vector, a matrix.

Example: x k

Preflabel: Variable

Relations:

- is_a math.Mathematical

- is_a semiotics.Conventional
- Inverse(math.hasVariable) some math.Mathematical

NaturalLaw

IRI: http://emmo.info/emmo/middle/models#EMMO_db9a009e_f097_43f5_9520_6cbc07e7610b

Preflabel: NaturalLaw

Relations:

- is_a models.Theory

Constant

IRI: http://emmo.info/emmo/middle/math#EMMO_ae15fb4f_8e4d_41de_a0f9_3997f89ba6a2

Elucidation: A 'varaible' that stand for a well known constant.

Example: π refers to the constant number ~3.14

Preflabel: Constant

Relations:

- is_a math.Variable
- Inverse(math.hasVariable) only math.Numerical

Conventional

IRI: http://emmo.info/emmo/middle/semiotics#EMMO_35d2e130_6e01_41ed_94f7_00b333d46cf9

Elucidation: A 'Sign' that stands for an 'Object' through convention, norm or habit, without any resemblance to it.

Preflabel: Conventional

Relations:

- is_a semiotics.Sign

Theory

IRI: http://emmo.info/emmo/middle/models#EMMO_8d2d9374_ef3a_47e6_8595_6bc208e07519

Elucidation: A 'conventional' that stand for a 'physical'.

Preflabel: Theory

Relations:

- is_a semiotics.Conventional

Property branch

SubjectiveProperty

IRI: http://emmo.info/emmo/middle/properties#EMMO_251cfb4f_5c75_4778_91ed_6c8395212fd8

Elucidation: A 'Property' that cannot be univocally determined and depends on an agent (e.g. a human individual, a community) acting as black-box.

Example: The beauty of that girl. The style of your clothing.

Preflabel: SubjectiveProperty

Relations:

- is_a properties.Property

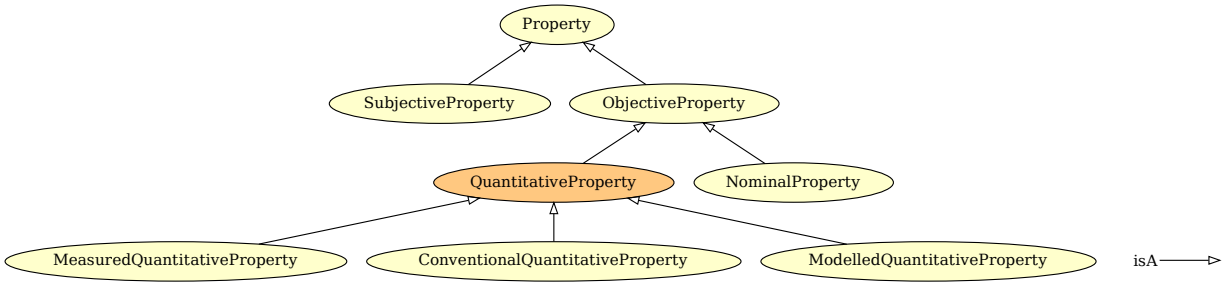


Figure 3.10: Property branch.

MeasuredQuantitativeProperty

IRI: http://emmo.info/emmo/middle/properties#EMMO_873b0ab3_88e6_4054_b901_5531e01f14a4

Preflabel: MeasuredQuantitativeProperty

Relations:

- is_a metrology.QuantitativeProperty

Property

IRI: http://emmo.info/emmo/middle/properties#EMMO_b7bcff25_ffc3_474e_9ab5_01b1664bd4ba

Elucidation: A 'Perceptual' referring to a specific code that is used as 'Conventional' sign to represent an 'Object' according to a specific interaction mechanism by an 'Observer'.

(A property is always a partial representation of an 'Object' since it reflects the 'Object' capability to be part of a specific 'Observation' process)

Example: Hardness is a subclass of properties.

Vickers hardness is a subclass of hardness that involves the procedures and instruments defined by the standard hardness test.

Example: Let's define the class 'colour' as the subclass of the properties that involve photon emission and an electromagnetic radiation sensible observer.

An individual C of this class 'colour' can be defined be declaring the process individual (e.g. daylight illumination) and the observer (e.g. my eyes)

Stating that an entity E hasProperty C, we mean that it can be observed by such setup of process + observer (i.e. observed by my eyes under daylight).

This definition can be generalized by using a generic human eye, so that the observer can be a generic human.

This can be used in material characterization, to define exactly the type of measurement done, including the instrument type.

Preflabel: Property

Relations:

- is_a semiotics.Conventional
- Inverse(holistic.hasParticipant) some properties.Observation
- Inverse(properties.hasProperty) some semiotics.Object
- disjoint_union_of properties.SubjectiveProperty, properties.ObjectiveProperty

QuantitativeProperty

IRI: http://emmo.info/emmo/middle/metrology#EMMO_dd4a7f3e_ef56_466c_ac1a_d2716b5f87ec

Definition: "A property of a phenomenon, body, or substance, where the property has a magnitude that can be expressed by means of a number and a reference" ISO 80000-1

"A reference can be a measurement unit, a measurement procedure, a reference material, or a combination of such." International vocabulary of metrology (VIM)

Elucidation: A 'Quantity' that can be quantified with respect to a standardized reference physical instance (e.g. the prototype meter bar, the kg prototype) or method (e.g. resilience) through a measurement process.

Preflabel: QuantitativeProperty

Relations:

- is_a metrology.Quantity
- is_a properties.ObjectiveProperty
- equivalent_to properties.MeasuredQuantitativeProperty or properties.ModelledQuantitativeProperty or properties.ConventionalQuantitativeProperty

ConventionalQuantitativeProperty

IRI: http://emmo.info/emmo/middle/properties#EMMO_d8aa8e1f_b650_416d_88a0_5118de945456

Elucidation: A quantitative property attributed by agreement to a quantity for a given purpose.

Example: The thermal conductivity of a copper sample in my laboratory can be assumed to be the conductivity that appears in the vendor specification. This value has been obtained by measurement of a sample which is not the one I have in my laboratory. This conductivity value is then a conventional quantitiative property assigned to my sample through a semiotic process in which no actual measurement is done by my laboratory.

If I don't believe the vendor, then I can measure the actual thermal conductivity. I then perform a measurement process that semiotically assign another value for the conductivity, which is a measured property, since is part of a measurement process.

Then I have two different physical quantities that are properties thanks to two different semiotic processes.

Preflabel: ConventionalQuantitativeProperty

Relations:

- is_a metrology.QuantitativeProperty

NominalProperty

IRI: http://emmo.info/emmo/middle/properties#EMMO_909415d1_7c43_4d5e_bbeb_7e1910159f66

Elucidation: An 'ObjectiveProperty' that cannot be quantified.

Example: CFC is a 'sign' that stands for the fact that the morphology of atoms composing the microstructure of an entity is predominantly Cubic Face Centered

A color is a nominal property.

Sex of a human being.

Preflabel: NominalProperty

Relations:

- is_a properties.ObjectiveProperty

ObjectiveProperty

IRI: http://emmo.info/emmo/middle/properties#EMMO_2a888cdf_ec4a_4ec5_af1c_0343372fc978

Elucidation: A 'Property' that is determined by each 'Observer' following a well defined 'Observation' procedure through a specific perception channel.

Preflabel: ObjectiveProperty

Relations:

- is_a properties.Property

ModelledQuantitativeProperty

IRI: http://emmo.info/emmo/middle/properties#EMMO_d0200cf1_e4f4_45ae_873f_b9359daea3cd

Preflabel: ModelledQuantitativeProperty

Relations:

- is_a metrology.QuantitativeProperty

Icon branch

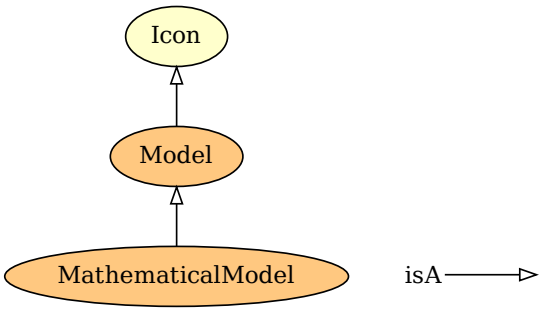


Figure 3.11: Icon branch.

Model

IRI: http://emmo.info/emmo/middle/models#EMMO_939483b1_0148_43d1_8b35_851d2cd5d939

Elucidation: A 'sign' that not only stands for a 'physical' or a 'process', but it is also a simplified representation, aimed to assist calculations for its description or for predictions of its behaviour.

A 'model' represents a 'physical' or a 'process' by direct similitude (e.g. small scale replica) or by capturing in a logical framework the relations between its properties (e.g. mathematical model).

Preflabel: Model

Relations:

- is_a semiotics.Icon
- equivalent_to Inverse(models.hasModel) some physical.Physical

Icon

IRI: http://emmo.info/emmo/middle/semiotics#EMMO_d7788d1a_020d_4c78_85a1_13563fcec168

Elucidation: A 'Sign' that stands for an 'Object' by resembling or imitating it, in shape or by sharing a similar logical structure.

Example: A picture that reproduces the aspect of a person.

An equation that reproduces the logical connection of the properties of a physical entity.

Preflabel: Icon

Relations:

- is_a semiotics.Sign

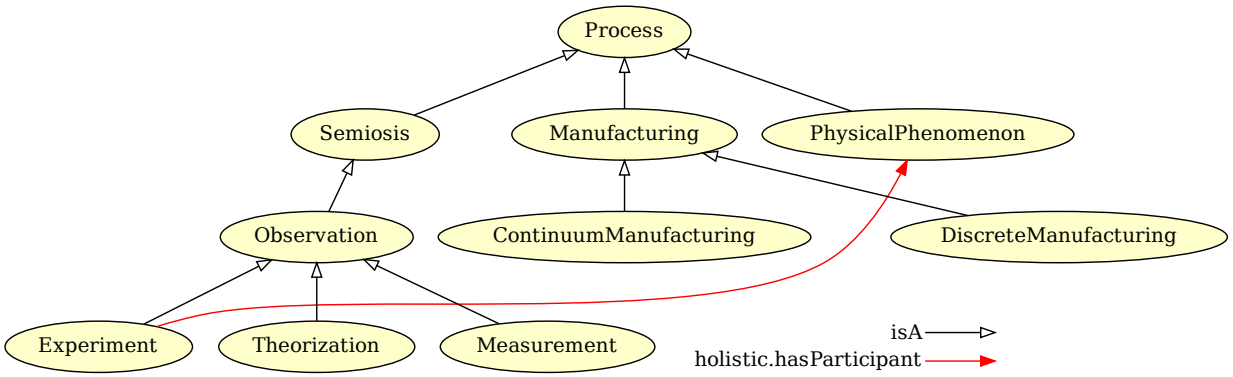


Figure 3.12: Process branch.

Process branch

ContinuumManufacturing

IRI: http://emmo.info/emmo/middle/manufacturing#EMMO_71d1c8f0_c6e3_44b5_a4b6_1b74ff35698a

Elucidation: A manufacturing process whose product is the result of the combination of more substances.

Example: Synthesis of materials, the preparation of a cake.

Preflabel: ContinuumManufacturing

Relations:

- is_a manufacturing.Manufacturing

Experiment

IRI: http://emmo.info/emmo/middle/models#EMMO_22522299_4091_4d1f_82a2_3890492df6db

Elucidation: An experiment is a process that is intended to replicate a physical phenomenon in a controlled environment.

Preflabel: Experiment

Relations:

- is_a properties.Observation
- holistic.hasParticipant some models.PhysicalPhenomenon

DiscreteManufacturing

IRI: http://emmo.info/emmo/middle/manufacturing#EMMO_8786cb47_8e1f_4968_9b15_f6d41fc51252

Elucidation: A manufacturing process aimed to the production of a device made of specific components.

Example: Assemblying a bicycle, building a car.

Preflabel: DiscreteManufacturing

Relations:

- is_a manufacturing.Manufacturing

Semiosis

IRI: http://emmo.info/emmo/middle/semiotics#EMMO_008fd3b2_4013_451f_8827_52bceab11841

Elucidation: A ‘Process’, that has participant an ‘Interpreter’, that is aimed to produce a ‘Sign’ representing another participant, the ‘Object’.

Example: Me looking a cat and saying loud: “Cat!” → the semiosis process

me → interpreter cat → object (in Peirce semiotics) the cat perceived by my mind → interpretant “Cat!” → sign, the produced sign

Preflabel: Semiosis

Relations:

- is_a holistic.Process
- holistic.hasProperParticipant some semiotics.Interpreter
- holistic.hasProperParticipant some semiotics.Object
- holistic.hasProperParticipant some semiotics.Sign

Observation

IRI: http://emmo.info/emmo/middle/properties#EMMO_10a5fd39_06aa_4648_9e70_f962a9cb2069

Elucidation: A ‘Semiosis’ that involves an ‘Observer’ that perceives another ‘Physical’ (the ‘Object’) through a specific perception mechanism and produces a ‘Property’ (the ‘Sign’) that stands for the result of that particular perception.

Preflabel: Observation

Relations:

- is_a semiotics.Semiosis
- holistic.hasParticipant some properties.Observer
- holistic.hasParticipant some properties.Property

Manufacturing

IRI: http://emmo.info/emmo/middle/manufacturing#EMMO_a4d66059_5dd3_4b90_b4cb_10960559441b

Elucidation: The process of transforming raw materials into a product by the use of manual labor, machinery or chemical/biological processes.

Preflabel: Manufacturing

Relations:

- is_a holistic.Process
- holistic.hasProperParticipant some manufacturing.Engineered

Theorization

IRI: http://emmo.info/emmo/middle/models#EMMO_6c739b1a_a774_4416_bb31_1961486fa9ed

Elucidation: The ‘semiosis’ process of interpreting a ‘physical’ and provide a complec sign, ‘theory’ that stands for it and explain it to another interpreter.

Preflabel: Theorization

Relations:

- is_a properties.Observation

Process

IRI: http://emmo.info/emmo/middle/holistic#EMMO_43e9a05d_98af_41b4_92f6_00f79a09bfce

Elucidation: A temporal part of a physical that identifies a particular type of evolution in time.

Preflabel: Process

Relations:

- is_a holistic.Holistic
- is_a physical.Physical
- holistic.hasParticipant some holistic.Participant

Measurement

IRI: http://emmo.info/emmo/middle/properties#EMMO_463bcfda_867b_41d9_a967_211d4d437cfb

Elucidation: An 'observation' that results in a quantitative comparison of a 'property' of an 'object' with a standard reference.

Preflabel: Measurement

Relations:

- is_a properties.Observation
- holistic.hasParticipant some metrology.QuantitativeProperty
- holistic.hasParticipant some properties.MeasurementInstrument

PhysicalPhenomenon

IRI: http://emmo.info/emmo/middle/models#EMMO_314d0bd5_67ed_437e_a609_36d46147cea7

Elucidation: A 'process' that is recognized by physical sciences and is catogrized accordingly.

Preflabel: PhysicalPhenomenon

Relations:

- is_a holistic.Process

Perceptual branch

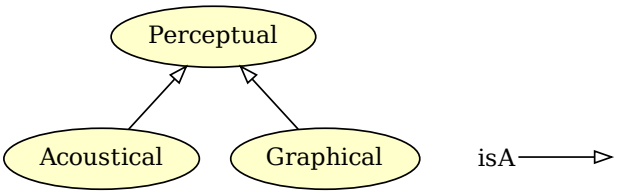


Figure 3.13: Perceptual branch.

Perceptual

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_649bf97b_4397_4005_90d9_219755d92e34

Elucidation: A 'Physical' which stands for a real world object that can stimulate a perception (e.g. a mental impression, the excitation of a sensor) to an interpreter (human or non-human).

Example: A line scratched on a surface. A sound. A smell. The word 'cat' and the sound of the word 'cat' (the first one is graphical and the second acoustical).

Example: The meta-semiotic process: I see a cloud in the sky. Since I'm an EMMO ontologist, I create an individual named Cloud under the 'Impression' class. This semiotic process occurs at meta-level: it's how I use the EMMO as tool for a direct representation of the world.

The semiotic process within EMMO: My friend looks at the same cloud and says: "It is an elephant". I use the EMMO to record this experience by declaring: - my friend as MyFriend individual, belonging to 'Interpreter' classes - the sound of the word "elephant" as an acoustical impression individual named ElephantWord, belonging to 'Impression' - a relation hasSign between Cloud and ElephantWord, that makes ElephantWord also belonging to 'Sign' class and Cloud belonging also to 'Object' class - a 'Semiosis' individual called MyFriendElephantCloud that hasParticipant: Cloud, ElephantWord and MyFriend, respectively as object, sign and interpreter.

Preflabel: Perceptual

Relations:

- is_a top.Perspective

Acoustical

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_4b3afb22_27cf_4ce3_88bc_492bfccb546b

Elucidation: A 'Perceptual' which stands for a real world object whose spatiotemporal pattern makes it identifiable by an observer as a sound.

Preflabel: Acoustical

Relations:

- is_a perceptual.Perceptual

Graphical branch

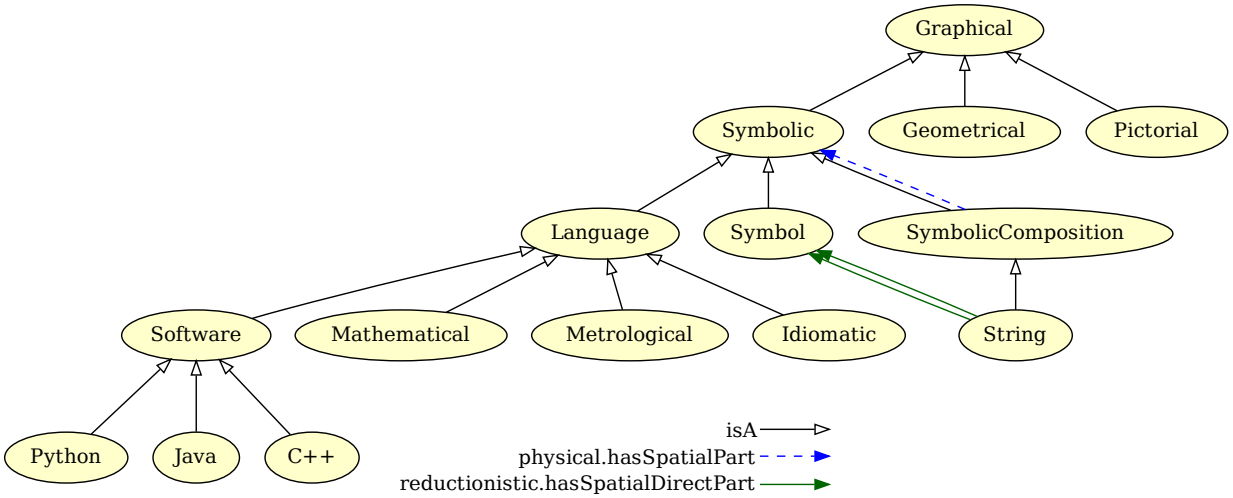


Figure 3.14: Graphical branch.

ArithmeticEquation

IRI: http://emmo.info/emmo/middle/math#EMMO_a6138ba7_e365_4f2d_b6b4_fe5a5918d403

Example: $1 + 1 = 2$

Preflabel: ArithmeticEquation

Relations:

- is_a math.Equation

Python

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_add2e29d_6d87_4b78_9706_588e25557093

Preflabel: Python

Relations:

- is_a perceptual.Software

AlgebricEquation

IRI: http://emmo.info/emmo/middle/math#EMMO_98d65021_4574_4890_b2fb_46430841077f

Example: 2 * a - b = c

Preflabel: AlgebricEquation

Relations:

- is_a math.Equation
- reductionistic.hasSpatialDirectPart some math.AlgebricExpression

Language

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_d8d2144e_5c8d_455d_a643_5caf4d8d9df8

Elucidation: A language object is a symbolic object respecting a specific language syntactic rules (a well-formed formula).

Preflabel: Language

Relations:

- is_a perceptual.Symbolic

Java

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_09007bc0_b5f2_4fb9_af01_caf948cf2044

Preflabel: Java

Relations:

- is_a perceptual.Software

Inequality

IRI: http://emmo.info/emmo/middle/math#EMMO_0b6ebe5a_0026_4bef_a1c1_5be00df9f98e

Elucidation: A relation which makes a non-equal comparison between two numbers or other mathematical expressions.

Example: f(x) > 0

Preflabel: Inequality

Relations:

- is_a math.MathematicalFormula

Symbolic

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_057e7d57_aff0_49de_911a_8861d85cef40

Elucidation: An 'Graphical' that stands for a token or a composition of tokens from one or more alphabets, without necessarily respecting syntactic rules.

Example: fe780 emmo !5*a cat for(i=0;i<N;++i)

Preflabel: Symbolic

Relations:

- is_a perceptual.Graphical

Software

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_8681074a_e225_4e38_b586_e85b0f43ce38

Elucidation: A language object that follows syntactic rules of a programming language.

Preflabel: Software

Relations:

- is_a perceptual.Language

MathematicalFormula

IRI: http://emmo.info/emmo/middle/math#EMMO_88470739_03d3_4c47_a03e_b30a1288d50c

Elucidation: A mathematical string that can be evaluated as true or false.

Preflabel: MathematicalFormula

Relations:

- is_a math.Mathematical
- is_a perceptual.SymbolicComposition

Graphical

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_c74da218_9147_4f03_92d1_8894abca55f3

Elucidation: A 'Perceptual' which stands for a real world object whose spatial configuration shows a pattern identifiable by an observer.

Example: 'Graphical' objects include writings, pictures, sketches …

Preflabel: Graphical

Relations:

- is_a perceptual.Perceptual

IdiomaticSymbol

IRI: http://emmo.info/emmo/middle/metrology#EMMO_0a318776_b067_4de0_a2a6_cba2cf6333f8

Preflabel: IdiomaticSymbol

Relations:

- is_a perceptual.Idiomatic
- is_a perceptual.Symbol
- equivalent_to perceptual.Idiomatic and perceptual.Symbol

SymbolicComposition

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_89a0c87c_0804_4013_937a_6fe234d9499c

Elucidation: A symbolic entity made of other symbolic entities according to a specific spatial configuration.

Preflabel: SymbolicComposition

Relations:

- is_a perceptual.Symbolic
- physical.hasSpatialPart some perceptual.Symbolic

Idiomatic

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_48716718_225f_4c88_89e2_d819d30c90a2

Elucidation: A language object that follows syntactic rules of a an idiom (e.g. english, italian).

Preflabel: Idiomatic

Relations:

- is_a perceptual.Language

PhysicsEquation

IRI: http://emmo.info/emmo/middle/models#EMMO_27c5d8c6_8af7_4d63_beb1_ec37cd8b3fa3

Elucidation: An 'equation' that stands for a 'physical_law' by mathematically defining the relations between physics_quantities.

Example: The Newton's equation of motion.

The Schrödinger equation.

The Navier-Stokes equation.

Preflabel: PhysicsEquation

Relations:

- is_a math.Equation
- is_a models.MathematicalModel
- reductionistic.hasSpatialDirectPart some metrology.PhysicalQuantity
- Inverse(models.hasModel) some models.PhysicalPhenomenon

C++

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_64aba1e5_24b7_4140_8eb4_676c35698e79

Elucidation: A language object respectin the syntactic rules of C++.

Preflabel: C++

Relations:

- is_a perceptual.Software

MaterialRelation

IRI: http://emmo.info/emmo/middle/models#EMMO_e5438930_04e7_4d42_ade5_3700d4a52ab7

Elucidation: An 'equation' that stands for a physical assumption specific to a material, and provides an expression for a 'physics_quantity' (the dependent variable) as function of other variables, physics_quantity or data (independent variables).

Example: The Lennard-Jones potential.

A force field.

An Hamiltonian.

Preflabel: MaterialRelation

Relations:

- is_a math.Equation
- reductionistic.hasSpatialDirectPart some metrology.PhysicalQuantity

FunctionDefinition

IRI: http://emmo.info/emmo/middle/math#EMMO_4bc29b0f_8fcc_4026_a291_f9774a66d9b8

Elucidation: A function defined using functional notation.

Example: y = f(x)

Preflabel: FunctionDefinition

Relations:

- is_a math.DefiningEquation

Equation

IRI: http://emmo.info/emmo/middle/math#EMMO_e56ee3eb_7609_4ae1_8bed_51974f0960a6

Elucidation: The class of 'mathematical'-s that stand for a statement of equality between two mathematical expressions.

Example: 2+3 = 5 x^2 +3x = 5x dv/dt = a sin(x) = y

Preflabel: Equation

Relations:

- is_a math.MathematicalFormula
- is_a reductionistic.State
- is_a math.Mathematical
- reductionistic.hasSpatialDirectPart some math.Expression

Pictorial

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_1da53c06_9577_4008_8652_272fa3b62be7

Elucidation: A 'Graphical' that stands for a real world object that shows a recognizable pictorial pattern without being necessarily associated to a symbolic language.

Example: A drawing of a cat. A circle on a paper sheet. The Mona Lisa.

Preflabel: Pictorial

Relations:

- is_a perceptual.Graphical

DefiningEquation

IRI: http://emmo.info/emmo/middle/math#EMMO_29afdf54_90ae_4c98_8845_fa9ea3f143a8

Elucidation: An equation that define a new variable in terms of other mathematical entities.

Example: The definition of velocity as v = dx/dt.

The definition of density as mass/volume.

y = f(x)

Preflabel: DefiningEquation

Relations:

- is_a math.Equation

String

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_50ea1ec5_f157_41b0_b46b_a9032f17ca10

Elucidation: A physical made of more than one symbol sequentially arranged.

Example: The word "cat" considered as a collection of 'symbol'-s respecting the rules of english language.

In this example the 'symbolic' entity "cat" is not related to the real cat, but it is only a word (like it would be to an italian person that ignores the meaning of this english word).

If an 'interpreter' skilled in english language is involved in a 'semiotic' process with this word, that "cat" became also a 'sign' i.e. it became for the 'interpreter' a representation for a real cat.

Preflabel: String

Relations:

- is_a perceptual.SymbolicComposition
- is_a reductionistic.State
- reductionistic.hasSpatialDirectPart some perceptual.Symbol
- reductionistic.hasSpatialDirectPart only perceptual.Symbol

Geometrical branch

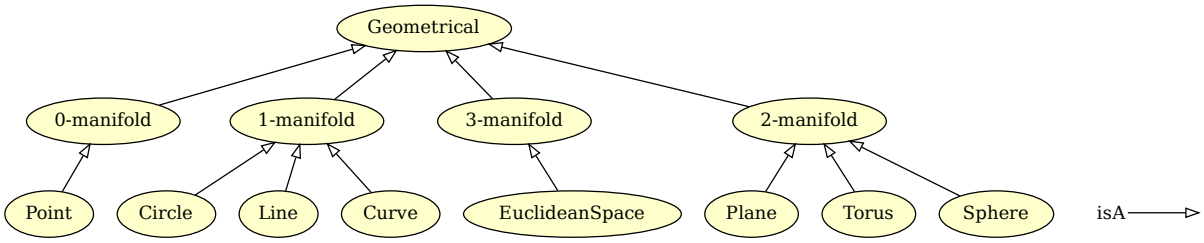


Figure 3.15: Geometrical branch.

Point

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_39362460_2a97_4367_8f93_0418c2ac9a08

Preflabel: Point

Relations:

- is_a perceptual.0-manifold

1-manifold

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_0c576e13_4ee7_4f3d_bfe9_1614243df018

Preflabel: 1-manifold

Relations:

- is_a perceptual.Geometrical

Circle

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_b2a234a8_579a_422c_9305_b8f7e72c76cd

Preflabel: Circle

Relations:

- is_a perceptual.1-manifold

0-manifold

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_0ab0485c_9e5b_4257_a679_90a2dfba5c7c

Preflabel: 0-manifold

Relations:

- is_a perceptual.Geometrical

3-manifold

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_46f0f8df_4dc6_418f_8036_10427a3a288e

Preflabel: 3-manifold

Relations:

- is_a perceptual.Geometrical

Geometrical

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_b5957cef_a287_442d_a3ce_fd39f20ba1cd

Elucidation: A 'graphical' aimed to represent a geometrical concept.

Preflabel: Geometrical

Relations:

- is_a perceptual.Graphical

Plane

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_25f5ca8e_8f7f_44d8_a392_bd3fe8894458

Preflabel: Plane

Relations:

- is_a perceptual.2-manifold

Torus

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_86060335_31c2_4820_b433_27c64aea0366

Preflabel: Torus

Relations:

- is_a perceptual.2-manifold

2-manifold

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_9268958f_7f54_48ab_a693_febe2645892b

Preflabel: 2-manifold

Relations:

- is_a perceptual.Geometrical

Line

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_3e309118_e8b7_4021_80f4_642d2df65d94

Preflabel: Line

Relations:

- is_a perceptual.1-manifold

EuclideanSpace

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_5f278af9_8593_4e27_a717_ccc9e07a0ddf

Preflabel: EuclideanSpace

Relations:

- is_a perceptual.3-manifold

Curve

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_0ef4ff4a_5458_4f2a_b51f_4689d472a3f2

Preflabel: Curve

Relations:

- is_a perceptual.1-manifold

Sphere

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_d7bf784a_db94_4dd9_861c_54f262846fbf

Preflabel: Sphere

Relations:

- is_a perceptual.2-manifold

Symbol branch

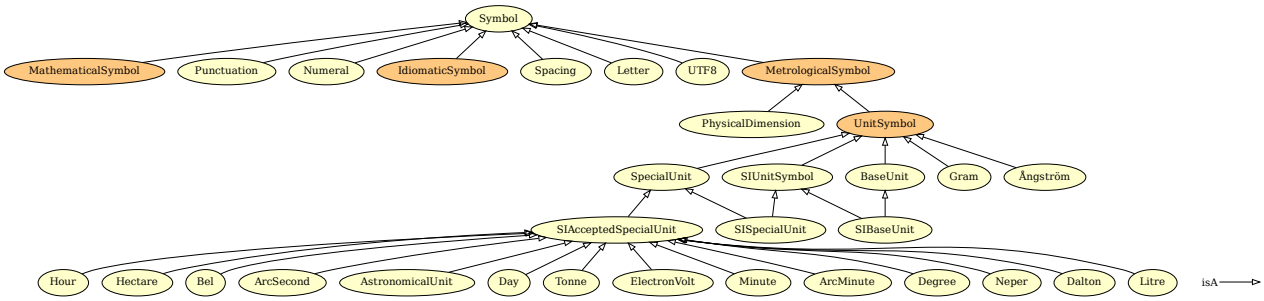


Figure 3.16: Symbol branch.

BaseUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_db716151_6b73_45ff_910c_d182fdcbb4f5

Elucidation: A set of units that correspond to the base quantities in a system of units.

Preflabel: BaseUnit

Relations:

- is_a metrology.UnitSymbol

SpecialUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_3ee80521_3c23_4dd1_935d_9d522614a3e2

Elucidation: A unit symbol that stands for a derived unit.

Example: Pa stands for N/m2 J stands for N m

Preflabel: SpecialUnit

Relations:

- is_a metrology.DerivedUnit
- is_a metrology.UnitSymbol
- is_a semiotics.Sign
- Inverse(semiotics.hasSign) some metrology.DerivedUnit

Hour

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_21ef2ed6_c086_4d24_8a75_980d2bcc9282

Definition: Measure of time defined as 3600 seconds.

Iupacentry: https://doi.org/10.1351/goldbook.H02866

Preflabel: Hour

Qudtentry: http://qudt.org/vocab/unit/HR

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.TimeDimension
- perceptual.hasSymbolData value “h”

SIAcceptedSpecialUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_6795a4b8_ffd0_4588_a581_a9413fe49cac

Elucidation: Non-SI units mentioned in the SI.

Preflabel: SIAcceptedSpecialUnit

Wikipediaentry: https://en.wikipedia.org/wiki/Non-SI_units_mentioned_in_the_SI

Relations:

- is_a metrology.SpecialUnit
- is_a metrology.OffSystemUnit
- disjoint_union_of units-extension.Dalton, units-extension.AstronomicalUnit, units-extension.ArcMinute, units-extension.Hour, units-extension.Day, units-extension.ArcSecond, units-extension.Bel, units-extension.Litre, units-extension.Neper, units-extension.Degree, units-extension.Minute, units-extension.Hectare, units-extension.ElectronVolt, units-extension.Tonne

Hectare

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_d6eb0176_a0d7_4b4e_8df0_50e912be2342

Definition: A non-SI metric unit of area defined as the square with 100-metre sides.

Dbpediaentry: http://dbpedia.org/page/Hectare

Preflabel: Hectare

Qudtentry: http://qudt.org/vocab/unit/HA

Wikipediaentry: https://en.wikipedia.org/wiki/Hectare

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.AreaDimension
- perceptual.hasSymbolData value “ha”

Punctuation

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_a817035a_3e3c_4709_8ede_3205df3031a3

Preflabel: Punctuation

Relations:

- is_a perceptual.Symbol

MetrologicalSymbol

IRI: http://emmo.info/emmo/middle/metrology#EMMO_50a3552e_859a_4ff7_946d_76d537cabce6

Elucidation: A symbol that stands for a concept in the language of the meterological domain of ISO 80000.

Preflabel: MetrologicalSymbol

Relations:

- is_a metrology.Metrological
- is_a perceptual.Symbol
- mereotopology.hasProperPart only not metrology.Metrological
- equivalent_to metrology.Metrological and perceptual.Symbol

Bel

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_6c7160fc_cc64_46f0_b43b_aba65e9952e3

Definition: One bel is defined as ½ `ln(10) neper`.

Elucidation: Unit of measurement for quantities of type level or level difference.

Preflabel: Bel

Qudtentry: http://qudt.org/vocab/unit/B

Wikipediaentry: https://en.wikipedia.org/wiki/Decibel

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “B”

ArcSecond

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_6a4547ab_3abb_430d_b81b_ce32d47729f5

Definition: Measure of plane angle defined as 1/3600 or a degree.

Altlabel: SecondOfArc

Preflabel: ArcSecond

Qudtentry: http://qudt.org/vocab/unit/ARCSEC

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “ ”

Symbol

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_a1083d0a_c1fb_471f_8e20_a98f881ad527

Elucidation: The class of individuals that stand for an elementary mark of a specific symbolic code (alphabet).

Example: The class of letter “A” is the symbol as idea and the letter A that you see on the screen is the mark.

Preflabel: Symbol

Relations:

- is_a perceptual.Symbolic

AstronomicalUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_053648ea_3c0a_468c_89cb_eb009239323a

Definition: One astronomical unit is defined as exactly 149597870700 m, which is roughly the distance from earth to sun.

Dbpediaentry: http://dbpedia.org/page/Astronomical_unit

Preflabel: AstronomicalUnit

Qudtentry: http://qudt.org/vocab/unit/PARSEC

Wikipediaentry: https://en.wikipedia.org/wiki/Astronomical_unit

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.LengthDimension

- perceptual.hasSymbolData value “au”

Day

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_28ef05a7_ecc1_4df6_8116_c53251fbd4a8

Definition: A measure of time defined as 86 400 seconds.

Dbpediaentry: http://dbpedia.org/page/Day

Iupacentry: https://doi.org/10.1351/goldbook.D01527

Preflabel: Day

Qudtentry: http://qudt.org/vocab/unit/DAY

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.TimeDimension
- perceptual.hasSymbolData value “d”

UnitSymbol

IRI: http://emmo.info/emmo/middle/metrology#EMMO_216f448e_cdbc_4aeb_a529_7a5fe7fc38bb

Elucidation: A symbol that stands for a single unit.

Example: Some examples are “Pa”, “m” and “J”.

Preflabel: UnitSymbol

Relations:

- is_a metrology.MetrologicalSymbol
- is_a metrology.NonPrefixedUnit
- equivalent_to metrology.MeasurementUnit and perceptual.Symbol
- disjoint_union_of metrology.SpecialUnit, metrology.BaseUnit

Tonne

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_f8b92999_3cde_46e3_99d5_664da3090a02

Definition: A non-SI unit defined as 1000 kg.

Iupacentry: https://doi.org/10.1351/goldbook.T06394

Preflabel: Tonne

Qudtentry: http://qudt.org/vocab/unit/TON_M

Wikipediaentry: https://en.wikipedia.org/wiki/Tonne

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.MassDimension
- perceptual.hasSymbolData value “t”

Numeral

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_74b05aed_66bf_43c8_aa2c_752a9ca8be03

Preflabel: Numeral

Relations:

- is_a perceptual.Symbol

IdiomaticSymbol

IRI: http://emmo.info/emmo/middle/metrology#EMMO_0a318776_b067_4de0_a2a6_cba2cf6333f8

Preflabel: IdiomaticSymbol

Relations:

- is_a perceptual.Idiomatic
- is_a perceptual.Symbol
- equivalent_to perceptual.Idiomatic and perceptual.Symbol

ElectronVolt

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_e29f84db_4c1c_46ae_aa38_c4d47536b972

Definition: The amount of energy gained (or lost) by the charge of a single electron moving across an electric potential difference of one volt.

Dbpediaentry: http://dbpedia.org/page/Electronvolt

Iupacentry: https://doi.org/10.1351/goldbook.E02014

Preflabel: ElectronVolt

Qudtentry: http://qudt.org/vocab/unit/EV

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.EnergyDimension
- perceptual.hasSymbolData value “eV”

Minute

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_cabb20f0_05c7_448f_9485_e129725f15a4

Definition: Non-SI time unit defined as 60 seconds.

Dbpediaentry: http://dbpedia.org/page/Minute

Preflabel: Minute

Qudtentry: http://qudt.org/vocab/unit/MIN

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.TimeDimension
- perceptual.hasSymbolData value “min”

ArcMinute

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_1e0b665d_db6c_4752_a6d4_262d3a8dbb46

Definition: Measure of plane angle defined as 1/60 or a degree.

Altlabel: MinuteOfArc

Preflabel: ArcMinute

Qudtentry: http://qudt.org/vocab/unit/ARCMIN

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “ ”

Degree

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_b8830065_3809_41b7_be3c_e33795567fd9

Definition: Degree is a measurement of plane angle, defined by representing a full rotation as 360 degrees.

Dbpediaentry: http://dbpedia.org/page/Degree_(angle)

Iupacentry: https://doi.org/10.1351/goldbook.D01560

Preflabel: Degree

Qudtentry: http://qudt.org/vocab/unit/DEG

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value "°"

Neper

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_b41515a9_28d8_4d78_8165_74b2fc72f89e

Definition: Unit of measurement for quantities of type level or level difference, which are defined as the natural logarithm of the ratio of power- or field-type quantities.

The value of a ratio in nepers is given by `ln(x1/x2)` where `x1` and `x2` are the values of interest (amplitudes), and ln is the natural logarithm. When the values are quadratic in the amplitude (e.g. power), they are first linearised by taking the square root before the logarithm is taken, or equivalently the result is halved.

Wikipedia

Dbpediaentry: http://dbpedia.org/page/Neper

Iupacentry: https://doi.org/10.1351/goldbook.N04106

Preflabel: Neper

Qudtentry: http://qudt.org/vocab/unit/NP

Wikipediaentry: https://en.wikipedia.org/wiki/Neper

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value "Np"

SIUnitSymbol

IRI: http://emmo.info/emmo/middle/siunits#EMMO_32129fb5_df25_48fd_a29c_18a2f22a2dd5

Preflabel: SIUnitSymbol

Relations:

- is_a metrology.UnitSymbol
- is_a siunits.SICoherentUnit
- disjoint_union_of siunits.SIBaseUnit, siunits.SISpecialUnit

Spacing

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_432192c4_111f_4e80_b7cd_c6ce1c1129ea

Preflabel: Spacing

Relations:

- is_a perceptual.Symbol

Dalton

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_00dd79e0_31a6_427e_9b9c_90f3097e4a96

Definition: One dalton is defined as one twelfth of the mass of an unbound neutral atom of carbon-12 in its nuclear and electronic ground state.

Dbpediaentry: http://dbpedia.org/page/Unified_atomic_mass_unit

Iupacentry: https://doi.org/10.1351/goldbook.D01514

Preflabel: Dalton

Qudtentry: http://qudt.org/vocab/unit/Dalton

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.MassDimension
- perceptual.hasSymbolData value “Da”

Litre

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_a155dc93_d266_487e_b5e7_2a2c72d5ebf9

Definition: A non-SI unit of volume defined as 1 cubic decimetre (dm3),

Iupacentry: https://doi.org/10.1351/goldbook.L03594

Preflabel: Litre

Qudtentry: http://qudt.org/vocab/unit/L

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.VolumeDimension
- perceptual.hasSymbolData value “l”

Gram

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_f992dc76_f9a6_45f6_8873_c8e20d16fbbe

Definition: Gram is defined as one thousandth of the SI unit kilogram.

Iupacentry: https://doi.org/10.1351/goldbook.G02680

Preflabel: Gram

Qudtentry: http://qudt.org/vocab/unit/GM

Wikipediaentry: https://en.wikipedia.org/wiki/Gram

Relations:

- is_a metrology.UnitSymbol
- is_a units-extension.CGSUnit
- metrology.hasPhysicalDimension some isq.MassDimension
- perceptual.hasSymbolData value “g”

Letter

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_bed2fe4c_dc7e_43a8_8200_6aac44030bff

Preflabel: Letter

Relations:

- is_a perceptual.Symbol

Ångström

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_27c530c4_dfcd_486e_b324_54ad4448cd26

Definition: Measure of length defined as 1e-10 metres.

Altlabel: Angstrom

Dbpediaentry: http://dbpedia.org/page/%C3%85ngstr%C3%B6m

Iupacentry: https://doi.org/10.1351/goldbook.N00350

Preflabel: Ångström

Qudtentry: http://qudt.org/vocab/unit/ANGSTROM

Wikipediaentry: https://en.wikipedia.org/wiki/Angstrom

Relations:

- is_a metrology.UnitSymbol
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.LengthDimension
- perceptual.hasSymbolData value "Å"

Mathematical branch

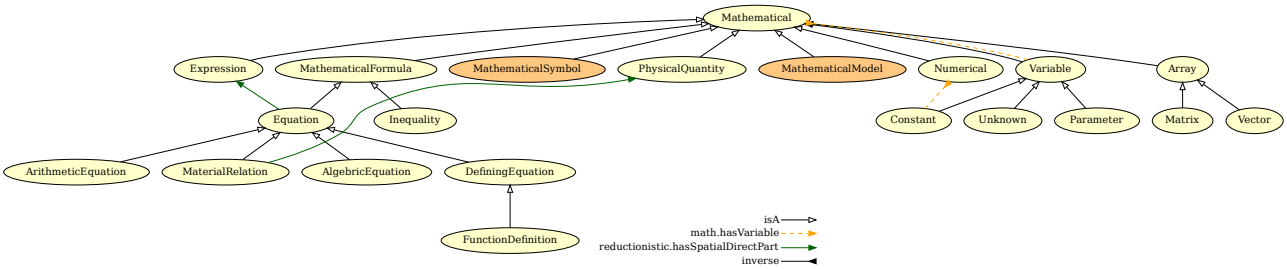


Figure 3.17: Mathematical branch.

ArithmeticEquation

IRI: http://emmo.info/emmo/middle/math#EMMO_a6138ba7_e365_4f2d_b6b4_fe5a5918d403

Example: 1 + 1 = 2

Preflabel: ArithmeticEquation

Relations:

- is_a math.Equation

PhysicsEquation

IRI: http://emmo.info/emmo/middle/models#EMMO_27c5d8c6_8af7_4d63_beb1_ec37cd8b3fa3

Elucidation: An 'equation' that stands for a 'physical_law' by mathematically defining the relations between physics_quantities.

Example: The Newton's equation of motion.

The Schrödinger equation.

The Navier-Stokes equation.

Preflabel: PhysicsEquation

Relations:

- is_a math.Equation

- is_a models.MathematicalModel
- reductionistic.hasSpatialDirectPart some metrology.PhysicalQuantity
- Inverse(models.hasModel) some models.PhysicalPhenomenon

Matrix

IRI: http://emmo.info/emmo/middle/math#EMMO_1cba0b27_15d0_4326_933f_379d0b3565b6

Preflabel: Matrix

Relations:

- is_a math.Array

Unknown

IRI: http://emmo.info/emmo/middle/math#EMMO_fe7e56ce_118b_4243_9aad_20eb9f4f31f6

Elucidation: The dependent variable for which an equation has been written.

Example: Velocity, for the Navier-Stokes equation.

Preflabel: Unknown

Relations:

- is_a math.Variable

AlgebricEquation

IRI: http://emmo.info/emmo/middle/math#EMMO_98d65021_4574_4890_b2fb_46430841077f

Example: 2 * a - b = c

Preflabel: AlgebricEquation

Relations:

- is_a math.Equation
- reductionistic.hasSpatialDirectPart some math.AlgebricExpression

MaterialRelation

IRI: http://emmo.info/emmo/middle/models#EMMO_e5438930_04e7_4d42_ade5_3700d4a52ab7

Elucidation: An 'equation' that stands for a physical assumption specific to a material, and provides an expression for a 'physics_quantity' (the dependent variable) as function of other variables, physics_quantity or data (independent variables).

Example: The Lennard-Jones potential.

A force field.

An Hamiltonian.

Preflabel: MaterialRelation

Relations:

- is_a math.Equation
- reductionistic.hasSpatialDirectPart some metrology.PhysicalQuantity

Mathematical

IRI: http://emmo.info/emmo/middle/math#EMMO_54ee6b5e_5261_44a8_86eb_5717e7fdb9d0

Elucidation: The class of general mathematical symbolic objects respecting mathematical syntactic rules.

Preflabel: Mathematical

Relations:

- is_a perceptual.Language

Vector

IRI: http://emmo.info/emmo/middle/math#EMMO_06658d8d_dcde_4fc9_aae1_17f71c0bcdec

Preflabel: Vector

Relations:

- is_a math.Array

Numerical

IRI: http://emmo.info/emmo/middle/math#EMMO_4ce76d7f_03f8_45b6_9003_90052a79bfaa

Elucidation: A 'Mathematical' that has no unknown value, i.e. all its 'Variable"-s parts refers to a 'Number' (for scalars that have a built-in datatype) or to another 'Numerical' (for complex numerical data structures that should rely on external implementations).

Preflabel: Numerical

Relations:

- is_a math.Mathematical

Parameter

IRI: http://emmo.info/emmo/middle/math#EMMO_d1d436e7_72fc_49cd_863b_7bfb4ba5276a

Example: viscosity in the Navier-Stokes equation

Preflabel: Parameter

Relations:

- is_a math.Variable

Array

IRI: http://emmo.info/emmo/middle/math#EMMO_28fbea28_2204_4613_87ff_6d877b855fcd%20

Preflabel: Array

Relations:

- is_a math.Mathematical

FunctionDefinition

IRI: http://emmo.info/emmo/middle/math#EMMO_4bc29b0f_8fcc_4026_a291_f9774a66d9b8

Elucidation: A function defined using functional notation.

Example: y = f(x)

Preflabel: FunctionDefinition

Relations:

- is_a math.DefiningEquation

Inequality

IRI: http://emmo.info/emmo/middle/math#EMMO_0b6ebe5a_0026_4bef_a1c1_5be00df9f98e

Elucidation: A relation which makes a non-equal comparison between two numbers or other mathematical expressions.

Example: f(x) > 0

Preflabel: Inequality

Relations:

- is_a math.MathematicalFormula

Equation

IRI: http://emmo.info/emmo/middle/math#EMMO_e56ee3eb_7609_4ae1_8bed_51974f0960a6

Elucidation: The class of 'mathematical'-s that stand for a statement of equality between two mathematical expressions.

Example: 2+3 = 5 x^2 +3x = 5x dv/dt = a sin(x) = y

Preflabel: Equation

Relations:

- is_a math.MathematicalFormula
- is_a reductionistic.State
- is_a math.Mathematical
- reductionistic.hasSpatialDirectPart some math.Expression

Variable

IRI: http://emmo.info/emmo/middle/math#EMMO_1eed0732_e3f1_4b2c_a9c4_b4e75eeb5895

Elucidation: A 'Variable' is a symbolic object that stands for a numerical defined 'Mathematical' object like e.g. a number, a vector, a matrix.

Example: x k

Preflabel: Variable

Relations:

- is_a math.Mathematical
- is_a semiotics.Conventional
- Inverse(math.hasVariable) some math.Mathematical

MathematicalFormula

IRI: http://emmo.info/emmo/middle/math#EMMO_88470739_03d3_4c47_a03e_b30a1288d50c

Elucidation: A mathematical string that can be evaluated as true or false.

Preflabel: MathematicalFormula

Relations:

- is_a math.Mathematical
- is_a perceptual.SymbolicComposition

DefiningEquation

IRI: http://emmo.info/emmo/middle/math#EMMO_29afdf54_90ae_4c98_8845_fa9ea3f143a8

Elucidation: An equation that define a new variable in terms of other mathematical entities.

Example: The definition of velocity as v = dx/dt.

The definition of density as mass/volume.

y = f(x)

Preflabel: DefiningEquation

Relations:

- is_a math.Equation

Constant

IRI: http://emmo.info/emmo/middle/math#EMMO_ae15fb4f_8e4d_41de_a0f9_3997f89ba6a2

Elucidation: A 'varaible' that stand for a well known constant.

Example: π refers to the constant number ~3.14

Preflabel: Constant

Relations:

- is_a math.Variable
- Inverse(math.hasVariable) only math.Numerical

Mathematical Symbol branch

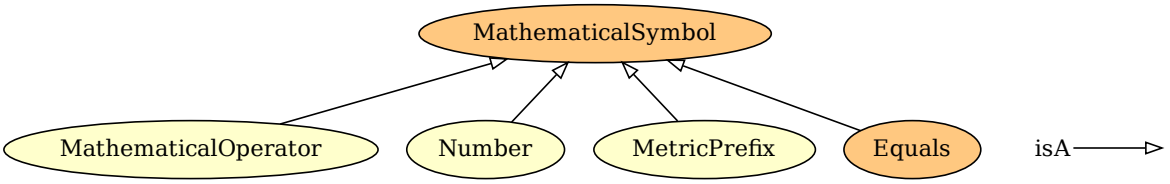


Figure 3.18: Mathematical Symbol branch.

MathematicalSymbol

IRI: http://emmo.info/emmo/middle/math#EMMO_5be83f9c_a4ba_4b9a_be1a_5bfc6e891231

Preflabel: MathematicalSymbol

Relations:

- is_a math.Mathematical
- is_a perceptual.Symbol
- mereotopology.hasProperPart only not math.Mathematical
- equivalent_to math.Mathematical and perceptual.Symbol

Equals

IRI: http://emmo.info/emmo/middle/math#EMMO_535d75a4_1972_40bc_88c6_ca566386934f

Elucidation: The equals symbol.

Preflabel: Equals

Relations:

- is_a math.MathematicalSymbol
- is_a math.Mathematical
- is_a perceptual.Symbol
- equivalent_to perceptual.hasSymbolData value "="

Mathematical Model branch

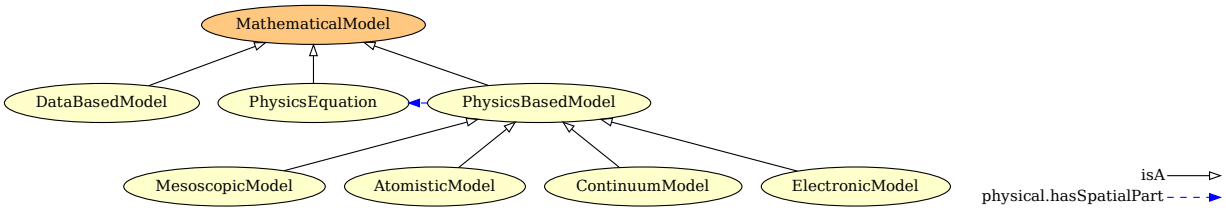


Figure 3.19: Mathematical Model branch.

DataBasedModel

IRI: http://emmo.info/emmo/middle/models#EMMO_a4b14b83_9392_4a5f_a2e8_b2b58793f59b

Elucidation: A computational model that uses existing data to create new insight into the behaviour of a system.

Preflabel: DataBasedModel

Relations:

- is_a models.MathematicalModel

PhysicsEquation

IRI: http://emmo.info/emmo/middle/models#EMMO_27c5d8c6_8af7_4d63_beb1_ec37cd8b3fa3

Elucidation: An 'equation' that stands for a 'physical_law' by mathematically defining the relations between physics_quantities.

Example: The Newton's equation of motion.

The Schrödinger equation.

The Navier-Stokes equation.

Preflabel: PhysicsEquation

Relations:

- is_a math.Equation
- is_a models.MathematicalModel
- reductionistic.hasSpatialDirectPart some metrology.PhysicalQuantity
- Inverse(models.hasModel) some models.PhysicalPhenomenon

MesoscopicModel

IRI: http://emmo.info/emmo/middle/models#EMMO_53935db0_af45_4426_b9e9_244a0d77db00

Elucidation: A physics-based model based on a physics equation describing the behaviour of mesoscopic entities, i.e. a set of bounded atoms like a molecule, bead or nanoparticle.

Preflabel: MesoscopicModel

Relations:

- is_a models.PhysicsBasedModel

AtomisticModel

IRI: http://emmo.info/emmo/middle/models#EMMO_84cadc45_6758_46f2_ba2a_5ead65c70213

Elucidation: A physics-based model based on a physics equation describing the behaviour of atoms.

Preflabel: AtomisticModel

Relations:

- is_a models.PhysicsBasedModel

MathematicalModel

IRI: http://emmo.info/emmo/middle/models#EMMO_f7ed665b_c2e1_42bc_889b_6b42ed3a36f0

Preflabel: MathematicalModel

Relations:

- is_a math.Mathematical
- is_a models.Model
- equivalent_to math.Mathematical and models.Model

ContinuumModel

IRI: http://emmo.info/emmo/middle/models#EMMO_4456a5d2_16a6_4ee1_9a8e_5c75956b28ea

Elucidation: A physics-based model based on a physics equation describing the behaviour of continuum volume.

Preflabel: ContinuumModel

Relations:

- is_a models.PhysicsBasedModel

ElectronicModel

IRI: http://emmo.info/emmo/middle/models#EMMO_6eca09be_17e9_445e_abc9_000aa61b7a11

Elucidation: A physics-based model based on a physics equation describing the behaviour of electrons.

Example: Density functional theory. Hartree-Fock.

Preflabel: ElectronicModel

Relations:

- is_a models.PhysicsBasedModel

PhysicsBasedModel

IRI: http://emmo.info/emmo/middle/models#EMMO_b29fd350_39aa_4af7_9459_3faa0544cba6

Elucidation: A solvable set of one Physics Equation and one or more Materials Relations.

Preflabel: PhysicsBasedModel

Relations:

- is_a models.MathematicalModel
- physical.hasSpatialPart some models.PhysicsEquation
- physical.hasSpatialPart some models.MaterialRelation

Mathematical Operator branch

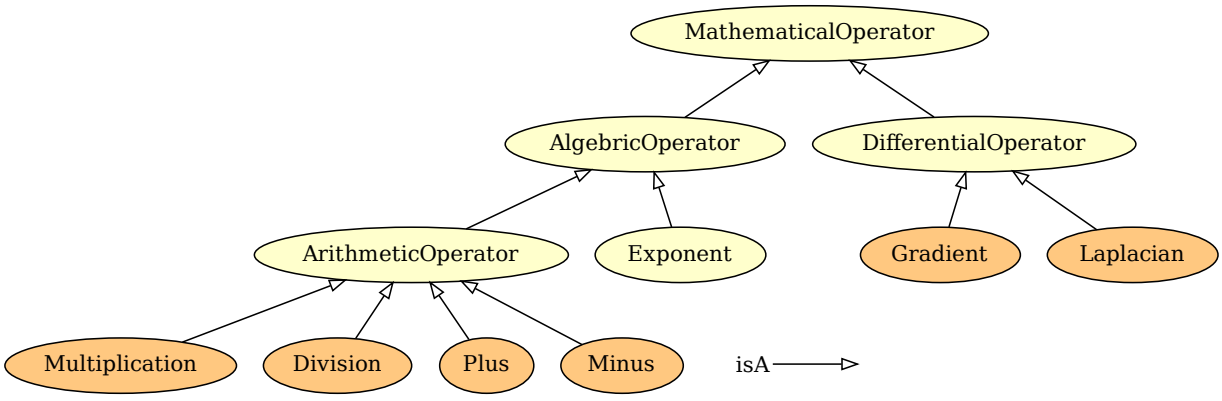


Figure 3.20: Mathematical Operator branch.

MathematicalOperator

IRI: http://emmo.info/emmo/middle/math#EMMO_f6d0c26a_98b6_4cf8_8632_aa259131faaa

Preflabel: MathematicalOperator

Relations:

- is_a math.MathematicalSymbol
- is_a math.Mathematical
- is_a perceptual.Symbol

AlgebricOperator

IRI: http://emmo.info/emmo/middle/math#EMMO_3c424d37_cf62_41b1_ac9d_a316f8d113d6

Preflabel: AlgebricOperator

Relations:

- is_a math.MathematicalOperator

Multiplication

IRI: http://emmo.info/emmo/middle/math#EMMO_2b1303e8_d4c3_453b_9918_76f1d009543f

Preflabel: Multiplication

Relations:

- is_a math.ArithmeticOperator
- equivalent_to perceptual.hasSymbolData value "*"

Division

IRI: http://emmo.info/emmo/middle/math#EMMO_a365b3c1_7bde_41d7_a15b_2820762e85f4

Preflabel: Division

Relations:

- is_a math.ArithmeticOperator
- equivalent_to perceptual.hasSymbolData value "/"

ArithmeticOperator

IRI: http://emmo.info/emmo/middle/math#EMMO_707f0cd1_941c_4b57_9f20_d0ba30cd6ff3

Preflabel: ArithmeticOperator

Relations:

- is_a math.AlgebricOperator

Exponent

IRI: http://emmo.info/emmo/middle/math#EMMO_223d9523_4169_4ecd_b8af_acad1215e1ff

Preflabel: Exponent

Relations:

- is_a math.AlgebricOperator

Gradient

IRI: http://emmo.info/emmo/middle/math#EMMO_b5c58790_fb2d_42eb_b184_2a3f6ca60acb

Preflabel: Gradient

Relations:

- is_a math.DifferentialOperator
- equivalent_to perceptual.hasSymbolData value "∇"

Laplacian

IRI: http://emmo.info/emmo/middle/math#EMMO_048a14e3_65fb_457d_8695_948965c89492

Preflabel: Laplacian

Relations:

- is_a math.DifferentialOperator
- equivalent_to perceptual.hasSymbolData value “Δ”

Plus

IRI: http://emmo.info/emmo/middle/math#EMMO_8de14a59_660b_454f_aff8_76a07ce185f4

Preflabel: Plus

Relations:

- is_a math.ArithmeticOperator
- equivalent_to perceptual.hasSymbolData value “+”

DifferentialOperator

IRI: http://emmo.info/emmo/middle/math#EMMO_f8a2fe9f_458b_4771_9aba_a50e76afc52d

Preflabel: DifferentialOperator

Relations:

- is_a math.MathematicalOperator

Minus

IRI: http://emmo.info/emmo/middle/math#EMMO_46d5643b_9706_4b67_8bea_ed77d6026539

Preflabel: Minus

Relations:

- is_a math.ArithmeticOperator
- equivalent_to perceptual.hasSymbolData value “-”

Metrological branch

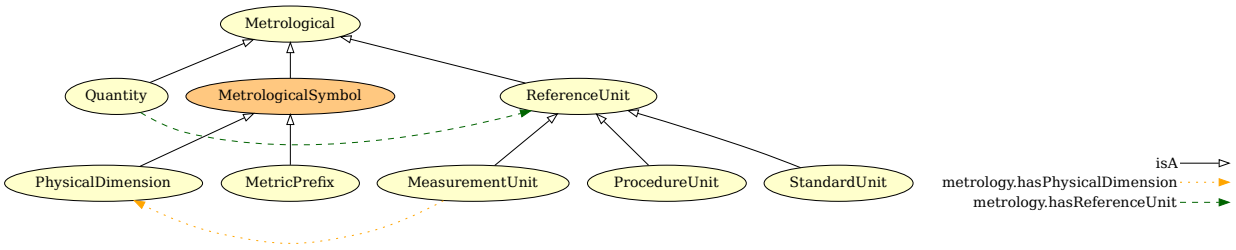


Figure 3.21: Metrological branch.

BaseUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_db716151_6b73_45ff_910c_d182fdcbb4f5

Elucidation: A set of units that correspond to the base quantities in a system of units.

Preflabel: BaseUnit

Relations:

- is_a metrology.UnitSymbol

ReferenceUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_18ce5200_00f5_45bb_8c6f_6fb128cd41ae

Preflabel: ReferenceUnit

Relations:

- is_a metrology.Metrological

SpecialUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_3ee80521_3c23_4dd1_935d_9d522614a3e2

Elucidation: A unit symbol that stands for a derived unit.

Example: Pa stands for N/m2 J stands for N m

Preflabel: SpecialUnit

Relations:

- is_a metrology.DerivedUnit
- is_a metrology.UnitSymbol
- is_a semiotics.Sign
- Inverse(semiotics.hasSign) some metrology.DerivedUnit

Hour

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_21ef2ed6_c086_4d24_8a75_980d2bcc9282

Definition: Measure of time defined as 3600 seconds.

Iupacentry: https://doi.org/10.1351/goldbook.H02866

Preflabel: Hour

Qudtentry: http://qudt.org/vocab/unit/HR

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.TimeDimension
- perceptual.hasSymbolData value “h”

SIAcceptedSpecialUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_6795a4b8_ffd0_4588_a581_a9413fe49cac

Elucidation: Non-SI units mentioned in the SI.

Preflabel: SIAcceptedSpecialUnit

Wikipediaentry: https://en.wikipedia.org/wiki/Non-SI_units_mentioned_in_the_SI

Relations:

- is_a metrology.SpecialUnit
- is_a metrology.OffSystemUnit
- disjoint_union_of units-extension.Dalton, units-extension.AstronomicalUnit, units-extension.ArcMinute, units-extension.Hour, units-extension.Day, units-extension.ArcSecond, units-extension.Bel, units-extension.Litre, units-extension.Neper, units-extension.Degree, units-extension.Minute, units-extension.Hectare, units-extension.ElectronVolt, units-extension.Tonne

Hectare

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_d6eb0176_a0d7_4b4e_8df0_50e912be2342

Definition: A non-SI metric unit of area defined as the square with 100-metre sides.

Dbpediaentry: http://dbpedia.org/page/Hectare

Preflabel: Hectare

Qudtentry: http://qudt.org/vocab/unit/HA

Wikipediaentry: https://en.wikipedia.org/wiki/Hectare

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.AreaDimension
- perceptual.hasSymbolData value “ha”

MetrologicalSymbol

IRI: http://emmo.info/emmo/middle/metrology#EMMO_50a3552e_859a_4ff7_946d_76d537cabce6

Elucidation: A symbol that stands for a concept in the language of the meterological domain of ISO 80000.

Preflabel: MetrologicalSymbol

Relations:

- is_a metrology.Metrological
- is_a perceptual.Symbol
- mereotopology.hasProperPart only not metrology.Metrological
- equivalent_to metrology.Metrological and perceptual.Symbol

Bel

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_6c7160fc_cc64_46f0_b43b_aba65e9952e3

Definition: One bel is defined as ½ `ln(10) neper`.

Elucidation: Unit of measurement for quantities of type level or level difference.

Preflabel: Bel

Qudtentry: http://qudt.org/vocab/unit/B

Wikipediaentry: https://en.wikipedia.org/wiki/Decibel

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “B”

ArcSecond

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_6a4547ab_3abb_430d_b81b_ce32d47729f5

Definition: Measure of plane angle defined as 1/3600 or a degree.

Altlabel: SecondOfArc

Preflabel: ArcSecond

Qudtentry: http://qudt.org/vocab/unit/ARCSEC

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “ ”

AstronomicalUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_053648ea_3c0a_468c_89cb_eb009239323a

Definition: One astronomical unit is defined as exactly 149597870700 m, which is roughly the distance from earth to sun.

Dbpediaentry: http://dbpedia.org/page/Astronomical_unit

Preflabel: AstronomicalUnit

Qudtentry: http://qudt.org/vocab/unit/PARSEC

Wikipediaentry: https://en.wikipedia.org/wiki/Astronomical_unit

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.LengthDimension
- perceptual.hasSymbolData value “au”

Day

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_28ef05a7_ecc1_4df6_8116_c53251fbd4a8

Definition: A measure of time defined as 86 400 seconds.

Dbpediaentry: http://dbpedia.org/page/Day

Iupacentry: https://doi.org/10.1351/goldbook.D01527

Preflabel: Day

Qudtentry: http://qudt.org/vocab/unit/DAY

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.TimeDimension
- perceptual.hasSymbolData value “d”

UnitSymbol

IRI: http://emmo.info/emmo/middle/metrology#EMMO_216f448e_cdbc_4aeb_a529_7a5fe7fc38bb

Elucidation: A symbol that stands for a single unit.

Example: Some examples are “Pa”, “m” and “J”.

Preflabel: UnitSymbol

Relations:

- is_a metrology.MetrologicalSymbol
- is_a metrology.NonPrefixedUnit
- equivalent_to metrology.MeasurementUnit and perceptual.Symbol
- disjoint_union_of metrology.SpecialUnit, metrology.BaseUnit

Tonne

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_f8b92999_3cde_46e3_99d5_664da3090a02

Definition: A non-SI unit defined as 1000 kg.

Iupacentry: https://doi.org/10.1351/goldbook.T06394

Preflabel: Tonne

Qudtentry: http://qudt.org/vocab/unit/TON_M

Wikipediaentry: https://en.wikipedia.org/wiki/Tonne

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.MassDimension
- perceptual.hasSymbolData value “t”

Metrological

IRI: http://emmo.info/emmo/middle/metrology#EMMO_985bec21_989f_4b9e_a4b3_735d88099c3c

Elucidation: A language object used in metrology.

Preflabel: Metrological

Relations:

- is_a perceptual.Language

ElectronVolt

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_e29f84db_4c1c_46ae_aa38_c4d47536b972

Definition: The amount of energy gained (or lost) by the charge of a single electron moving across an electric potential difference of one volt.

Dbpediaentry: http://dbpedia.org/page/Electronvolt

Iupacentry: https://doi.org/10.1351/goldbook.E02014

Preflabel: ElectronVolt

Qudtentry: http://qudt.org/vocab/unit/EV

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.EnergyDimension
- perceptual.hasSymbolData value “eV”

Minute

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_cabb20f0_05c7_448f_9485_e129725f15a4

Definition: Non-SI time unit defined as 60 seconds.

Dbpediaentry: http://dbpedia.org/page/Minute

Preflabel: Minute

Qudtentry: http://qudt.org/vocab/unit/MIN

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.TimeDimension
- perceptual.hasSymbolData value “min”

ArcMinute

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_1e0b665d_db6c_4752_a6d4_262d3a8dbb46

Definition: Measure of plane angle defined as 1/60 or a degree.

Altlabel: MinuteOfArc

Preflabel: ArcMinute

Qudtentry: http://qudt.org/vocab/unit/ARCMIN

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “ ”

Degree

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_b8830065_3809_41b7_be3c_e33795567fd9

Definition: Degree is a measurement of plane angle, defined by representing a full rotation as 360 degrees.

Dbpediaentry: http://dbpedia.org/page/Degree_(angle)

Iupacentry: https://doi.org/10.1351/goldbook.D01560

Preflabel: Degree

Qudtentry: http://qudt.org/vocab/unit/DEG

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “°”

ProcedureUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_c9c8f824_9127_4f93_bc21_69fe78a7f6f2

Elucidation: A reference unit provided by a measurement procedure.

Example: Rockwell C hardness of a given sample (150 kg load): 43.5HRC(150 kg)

Preflabel: ProcedureUnit

Relations:

- is_a metrology.ReferenceUnit

Neper

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_b41515a9_28d8_4d78_8165_74b2fc72f89e

Definition: Unit of measurement for quantities of type level or level difference, which are defined as the natural logarithm of the ratio of power- or field-type quantities.

The value of a ratio in nepers is given by `ln(x1/x2)` where `x1` and `x2` are the values of interest (amplitudes), and ln is the natural logarithm. When the values are quadratic in the amplitude (e.g. power), they are first linearised by taking the square root before the logarithm is taken, or equivalently the result is halved.

Wikipedia

Dbpediaentry: http://dbpedia.org/page/Neper

Iupacentry: https://doi.org/10.1351/goldbook.N04106

Preflabel: Neper

Qudtentry: http://qudt.org/vocab/unit/NP

Wikipediaentry: https://en.wikipedia.org/wiki/Neper

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “Np”

SIUnitSymbol

IRI: http://emmo.info/emmo/middle/siunits#EMMO_32129fb5_df25_48fd_a29c_18a2f22a2dd5

Preflabel: SIUnitSymbol

Relations:

- is_a metrology.UnitSymbol
- is_a siunits.SICoherentUnit
- disjoint_union_of siunits.SIBaseUnit, siunits.SISpecialUnit

StandardUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_acd1a504_ca32_4f30_86ad_0b62cea5bc02

Elucidation: A reference unit provided by a reference material. International vocabulary of metrology (VIM)

Example: Arbitrary amount-of-substance concentration of lutropin in a given sample of plasma (WHO international standard 80/552): 5.0 International Unit/l

Preflabel: StandardUnit

Relations:

- is_a metrology.ReferenceUnit

Dalton

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_00dd79e0_31a6_427e_9b9c_90f3097e4a96

Definition: One dalton is defined as one twelfth of the mass of an unbound neutral atom of carbon-12 in its nuclear and electronic ground state.

Dbpediaentry: http://dbpedia.org/page/Unified_atomic_mass_unit

Iupacentry: https://doi.org/10.1351/goldbook.D01514

Preflabel: Dalton

Qudtentry: http://qudt.org/vocab/unit/Dalton

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.MassDimension
- perceptual.hasSymbolData value “Da”

Litre

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_a155dc93_d266_487e_b5e7_2a2c72d5ebf9

Definition: A non-SI unit of volume defined as 1 cubic decimetre (dm3),

Iupacentry: https://doi.org/10.1351/goldbook.L03594

Preflabel: Litre

Qudtentry: http://qudt.org/vocab/unit/L

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.VolumeDimension
- perceptual.hasSymbolData value “l”

Gram

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_f992dc76_f9a6_45f6_8873_c8e20d16fbbe

Definition: Gram is defined as one thousandth of the SI unit kilogram.

Iupacentry: https://doi.org/10.1351/goldbook.G02680

Preflabel: Gram

Qudtentry: http://qudt.org/vocab/unit/GM

Wikipediaentry: https://en.wikipedia.org/wiki/Gram

Relations:

- is_a metrology.UnitSymbol
- is_a units-extension.CGSUnit
- metrology.hasPhysicalDimension some isq.MassDimension
- perceptual.hasSymbolData value “g”

Ångström

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_27c530c4_dfcd_486e_b324_54ad4448cd26

Definition: Measure of length defined as 1e-10 metres.

Altlabel: Angstrom

Dbpediaentry: http://dbpedia.org/page/%C3%85ngstr%C3%B6m

Iupacentry: https://doi.org/10.1351/goldbook.N00350

Preflabel: Ångström

Qudtentry: http://qudt.org/vocab/unit/ANGSTROM

Wikipediaentry: https://en.wikipedia.org/wiki/Angstrom

Relations:

- is_a metrology.UnitSymbol
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.LengthDimension
- perceptual.hasSymbolData value “Å”

Physical Dimension branch

EntropyDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_3ecff38b_b3cf_4a78_b49f_8580abf8715b

Preflabel: EntropyDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T-2 L+2 M+1 I0 Θ-1 N0 J0”

InductanceDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_585e0ff0_9429_4d3c_b578_58abb1ba21d1

Preflabel: InductanceDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T-2 L+2 M+1 I-2 Θ0 N0 J0”

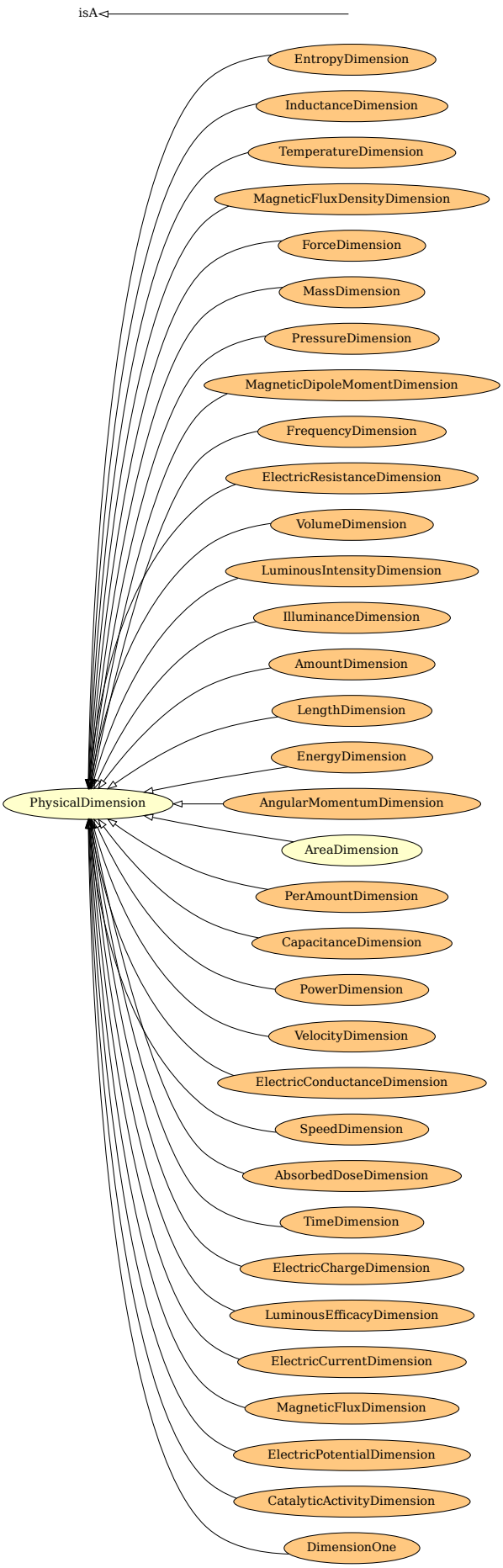


Figure 3.22: Physical Dimension branch.

TemperatureDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_a77a0a4b_6bd2_42b2_be27_4b63cebbb59e

Preflabel: TemperatureDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T0 L0 M0 I0 Θ+1 N0 J0”

MagneticFluxDensityDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_ec903946_ddc9_464a_903c_7373e0d1eeb5

Preflabel: MagneticFluxDensityDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T-2 L0 M+1 I-1 Θ0 N0 J0”

ForceDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_53e825d9_1a09_483c_baa7_37501ebfbe1c

Preflabel: ForceDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T-2 L+1 M+1 I0 Θ0 N0 J0”

MassDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_77e9dc31_5b19_463e_b000_44c6e79f98aa

Preflabel: MassDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T0 L0 M+1 I0 Θ0 N0 J0”

PressureDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_53bd0c90_41c3_46e2_8779_cd2a80f7e18b

Preflabel: PressureDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T-2 L-1 M+1 I0 Θ0 N0 J0”

PhysicalDimension

IRI: http://emmo.info/emmo/middle/metrology#EMMO_9895a1b4_f0a5_4167_ac5e_97db40b8bfcc

Elucidation: A symbol that, following SI specifications, describe the physical dimensionality of a physical quantity and the exponents of the base units in a measurement unit.

Preflabel: PhysicalDimension

Relations:

- is_a metrology.MetrologicalSymbol
- is_a metrology.Metrological
- is_a perceptual.Symbol

MagneticDipoleMomentDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_1c2226a9_22f0_40c8_8928_5a01d398f96e

Preflabel: MagneticDipoleMomentDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T+1 L+1 M0 I+1 Θ0 N0 J0”

FrequencyDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_515b5579_d526_4842_9e6f_ecc34db6f368

Preflabel: FrequencyDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T-1 L0 M0 I0 Θ0 N0 J0”

ElectricResistanceDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_7610efb8_c7c6_4684_abc1_774783c62472

Preflabel: ElectricResistanceDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T-3 L+2 M+1 I-2 Θ0 N0 J0”

VolumeDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_9141801c_c539_4c72_b423_8c74ff6b8f05

Preflabel: VolumeDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T0 L+3 M0 I0 Θ0 N0 J0”

LuminousIntensityDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_14ff4393_0f28_4fb4_abc7_c2cc00bc761d

Preflabel: LuminousIntensityDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T0 L0 M0 I0 Θ0 N0 J+1”

IlluminanceDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_668e6ead_1530_40cc_ad5e_24b880edff50

Preflabel: IlluminanceDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T0 L-2 M0 I0 Θ0 N0 J+1”

AmountDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_e501069c_34d3_4dc7_ac87_c90c7342192b

Preflabel: AmountDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T0 L0 M0 I0 Θ0 N+1 J0”

LengthDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_b3600e73_3e05_479d_9714_c041c3acf5cc

Preflabel: LengthDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T0 L+1 M0 I0 Θ0 N0 J0”

EnergyDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_f6070071_d054_4b17_9d2d_f446f7147d0f

Preflabel: EnergyDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T-2 L+2 M+1 I0 Θ0 N0 J0”

AngularMomentumDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_501f9b3a_c469_48f7_9281_2e6a8d805d7a

Preflabel: AngularMomentumDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T-1 L+2 M+1 I0 Θ0 N0 J0”

AreaDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_33433bb1_c68f_45ee_a466_f01e2c57b214

Preflabel: AreaDimension

Relations:

- is_a metrology.PhysicalDimension
- perceptual.hasSymbolData value “T0 L2 M0 I0 Θ0 N0 J0”

PerAmountDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_af24ae20_8ef2_435a_86a1_2ea44488b318

Preflabel: PerAmountDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T0 L0 M0 I0 Θ0 N-1 J0”

CapacitanceDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_b14d9be5_f81e_469b_abca_379c2e83feab

Preflabel: CapacitanceDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T+4 L-2 M-1 I+2 Θ0 N0 J0”

PowerDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_c8d084ad_f88e_4596_8e4d_982c6655ce6f

Preflabel: PowerDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T-3 L+2 M+1 I0 Θ0 N0 J0”

VelocityDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_f84792eb_ec64_4a6b_941f_c9f3e9ef052c

Preflabel: VelocityDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T-1 L+1 M0 I0 Θ0 N0 J0”

ElectricConductanceDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_321af35f_f0cc_4a5c_b4fe_8c2c0303fb0c

Preflabel: ElectricConductanceDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T+3 L-2 M-1 I+2 Θ0 N0 J0”

SpeedDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_4f5c7c54_1c63_4d17_b12b_ea0792c2b187

Preflabel: SpeedDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to isq.VelocityDimension
- equivalent_to perceptual.hasSymbolData value “T-1 L+1 M0 I0 Θ0 N0 J0”

AbsorbedDoseDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_847f1d9f_205e_46c1_8cb6_a9e479421f88

Preflabel: AbsorbedDoseDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T-2 L+2 M0 I0 Θ0 N0 J0”

TimeDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_02e894c3_b793_4197_b120_3442e08f58d1

Preflabel: TimeDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T+1 L0 M0 I0 Θ0 N0 J0”

ElectricChargeDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_ab79e92b_5377_454d_be06_d61b50db295a

Preflabel: ElectricChargeDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T+1 L0 M0 I+1 Θ0 N0 J0”

LuminousEfficacyDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_5c003f53_20a2_4bd7_8445_58187e582578

Preflabel: LuminousEfficacyDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T+3 L-1 M-1 I0 Θ0 N0 J+1”

ElectricCurrentDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_d5f3e0e5_fc7d_4e64_86ad_555e74aaff84

Preflabel: ElectricCurrentDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T0 L0 M0 I+1 Θ0 N0 J0”

MagneticFluxDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_4c49ab58_a6f6_409e_b849_f873ae1dcbee

Preflabel: MagneticFluxDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T-2 L+2 M+1 I-1 Θ0 N0 J0”

ElectricPotentialDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_2e7e5796_4a80_4d73_bb84_f31138446c0c

Preflabel: ElectricPotentialDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T-3 L+2 M+1 I-1 Θ0 N0 J0”

CatalyticActivityDimension

IRI: http://emmo.info/emmo/middle/isq#EMMO_ce7d4720_aa20_4a8c_93e8_df41a35b6723

Preflabel: CatalyticActivityDimension

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T-1 L0 M0 I0 Θ0 N+1 J0”

DimensionOne

IRI: http://emmo.info/emmo/middle/metrology#EMMO_3227b821_26a5_4c7c_9c01_5c24483e0bd0

Preflabel: DimensionOne

Relations:

- is_a metrology.PhysicalDimension
- equivalent_to perceptual.hasSymbolData value “T0 L0 M0 I0 Θ0 N0 J0”

Physical Quantity branch

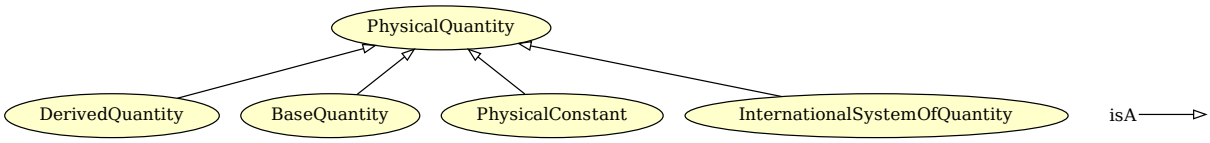


Figure 3.23: Physical Quantity branch.

Radioactivity

IRI: http://emmo.info/emmo/middle/isq#EMMO_8d3da9ac_2265_4382_bee5_db72046722f8

Elucidation: Decays per unit time.

Iupacentry: https://doi.org/10.1351/goldbook.A00114

Physicaldimension: T-1 L0 M0 I0 Θ0 N0 J0

Preflabel: Radioactivity

Qudtentry: http://qudt.org/vocab/quantitykind/SpecificActivity

Relations:

- is_a isq.ISQDerivedQuantity

PureNumberQuantity

IRI: http://emmo.info/emmo/middle/isq#EMMO_ba882f34_0d71_4e4f_9d92_0c076c633a2c

Elucidation: A pure number, typically the number of something.

Example: 1, i, π, the number of protons in the nucleus of an atom

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: PureNumberQuantity

Relations:

- is_a isq.ISQDimensionlessQuantity

ElectricDipoleMoment

IRI: http://emmo.info/emmo/middle/isq#EMMO_1a179ce4_3724_47f8_bee5_6292e3ac9942

Elucidation: An electric dipole, vector quantity of magnitude equal to the product of the positive charge and the distance between the charges and directed from the negative charge to the positive charge.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=121-11-35

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=121-11-36

Dbpediaentry: http://dbpedia.org/page/Electric_dipole_moment

Iupacentry: https://doi.org/10.1351/goldbook.E01929

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/ElectricDipoleMoment

Physicaldimension: T+1 L+1 M0 I+1 Θ0 N0 J0

Preflabel: ElectricDipoleMoment

Qudtentry: http://qudt.org/vocab/quantitykind/ElectricDipoleMoment

Relations:

- is_a isq.ISQDerivedQuantity

LuminousFlux

IRI: http://emmo.info/emmo/middle/isq#EMMO_e2ee1c98_497a_4f66_b4ed_5711496a848e

Elucidation: Perceived power of light.

Dbpediaentry: http://dbpedia.org/page/Luminous_flux

Iupacentry: https://doi.org/10.1351/goldbook.L03646

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J+1

Preflabel: LuminousFlux

Qudtentry: http://qudt.org/vocab/quantitykind/LuminousFlux

Relations:

- is_a isq.ISQDerivedQuantity

Pressure

IRI: http://emmo.info/emmo/middle/isq#EMMO_50a44256_9dc5_434b_bad4_74a4d9a29989

Elucidation: The force applied perpendicular to the surface of an object per unit area over which that force is distributed.

Dbpediaentry: http://dbpedia.org/page/Pressure

Iupacentry: https://doi.org/10.1351/goldbook.P04819

Physicaldimension: T-2 L-1 M+1 I0 Θ0 N0 J0

Preflabel: Pressure

Qudtentry: http://qudt.org/vocab/quantitykind/Pressure

Relations:

- is_a isq.ISQDerivedQuantity

DoseEquivalent

IRI: http://emmo.info/emmo/middle/isq#EMMO_3df10765_f6ff_4c9e_be3d_10b1809d78bd

Elucidation: A dose quantity used in the International Commission on Radiological Protection (ICRP) system of radiological protection.

Dbpediaentry: http://dbpedia.org/page/Energy

Iupacentry: https://doi.org/10.1351/goldbook.E02101

Physicaldimension: T-2 L+2 M0 I0 Θ0 N0 J0

Preflabel: DoseEquivalent

Qudtentry: http://qudt.org/vocab/quantitykind/DoseEquivalent

Relations:

- is_a isq.ISQDerivedQuantity

ElectricImpedance

IRI: http://emmo.info/emmo/middle/isq#EMMO_79a02de5_b884_4eab_bc18_f67997d597a2

Altlabel: Impedance

Dbpediaentry: http://dbpedia.org/page/Electrical_impedance

Physicaldimension: T-3 L+2 M+1 I-2 Θ0 N0 J0

Preflabel: ElectricImpedance

Qudtentry: http://qudt.org/vocab/quantitykind/Impedance

Relations:

- is_a isq.ElectricResistance

Strain

IRI: http://emmo.info/emmo/middle/isq#EMMO_acf636d4_9ac2_4ce3_960a_d54338e6cae3

Elucidation: Change of the relative positions of parts of a body, excluding a displacement of the body as a whole.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-03-57

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/Strain

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: Strain

Qudtentry: http://qudt.org/vocab/quantitykind/Strain

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only units-extension.LengthFractionUnit

ReciprocalLength

IRI: http://emmo.info/emmo/middle/isq#EMMO_ecec2983_7c26_4f8d_a981_51ca29668baf

Elucidation: The inverse of length.

Altlabel: InverseLength

Dbpediaentry: http://dbpedia.org/page/Reciprocal_length

Physicaldimension: T0 L-1 M0 I0 Θ0 N0 J0

Preflabel: ReciprocalLength

Qudtentry: http://qudt.org/vocab/quantitykind/InverseLength

Wikipediaentry: https://en.wikipedia.org/wiki/Reciprocal_length

Relations:

- is_a isq.ISQDerivedQuantity

Frequency

IRI: http://emmo.info/emmo/middle/isq#EMMO_852b4ab8_fc29_4749_a8c7_b92d4fca7d5a

Elucidation: Number of periods per time interval.

Dbpediaentry: http://dbpedia.org/page/Frequency

Iupacentry: https://doi.org/10.1351/goldbook.FT07383

Physicaldimension: T-1 L0 M0 I0 Θ0 N0 J0

Preflabel: Frequency

Qudtentry: http://qudt.org/vocab/quantitykind/Frequency

Relations:

- is_a isq.ISQDerivedQuantity

CatalyticActivity

IRI: http://emmo.info/emmo/middle/isq#EMMO_bd67d149_24c2_4bc9_833a_c2bc26f98fd3

Elucidation: Increase in the rate of reaction of a specified chemical reaction that an enzyme produces in a specific assay system.

Iupacentry: https://doi.org/10.1351/goldbook.C00881

Physicaldimension: T-1 L0 M0 I0 Θ0 N+1 J0

Preflabel: CatalyticActivity

Qudtentry: http://qudt.org/vocab/quantitykind/CatalyticActivity

Relations:

- is_a isq.ISQDerivedQuantity

Torque

IRI: http://emmo.info/emmo/middle/isq#EMMO_aaf9dd7f_0474_40d0_9606_02def8515249

Elucidation: The effectiveness of a force to produce rotation about an axis, measured by the product of the force and the perpendicular distance from the line of action of the force to the axis.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-03-26

Dbpediaentry: http://dbpedia.org/page/Torque

Iupacentry: https://doi.org/10.1351/goldbook.T06400

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/Torque

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: Torque

Qudtentry: http://qudt.org/vocab/quantitykind/Torque

Relations:

- is_a isq.ISQDerivedQuantity

Permittivity

IRI: http://emmo.info/emmo/middle/isq#EMMO_0ee5779e_d798_4ee5_9bfe_c392d5bea112

Dbpediaentry: http://dbpedia.org/page/Permittivity

Iupacentry: https://doi.org/10.1351/goldbook.P04507

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/Permittivity

Physicaldimension: T+4 L-3 M-1 I+2 Θ0 N0 J0

Preflabel: Permittivity

Qudtentry: http://qudt.org/vocab/quantitykind/Permittivity

Relations:

- is_a isq.ISQDerivedQuantity

SpeedOfLightInVacuum

IRI: http://emmo.info/emmo/middle/isq#EMMO_99296e55_53f7_4333_9e06_760ad175a1b9

Elucidation: The speed of light in vacuum. Defines the base unit metre in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?c

Dbpediaentry: http://dbpedia.org/page/Speed_of_light

Iupacentry: https://doi.org/10.1351/goldbook.S05854

Physicaldimension: T-1 L+1 M0 I0 Θ0 N0 J0

Preflabel: SpeedOfLightInVacuum

Qudtentry: http://qudt.org/vocab/constant/SpeedOfLight_Vacuum

Relations:

- is_a isq.Speed
- is_a isq.SIExactConstant

ElectronMass

IRI: http://emmo.info/emmo/middle/isq#EMMO_44fc8c60_7a9c_49af_a046_e1878c88862c

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?me

Dbpediaentry: http://dbpedia.org/page/Electron_rest_mass

Iupacentry: https://doi.org/10.1351/goldbook.E02008

Physicaldimension: T0 L0 M+1 I0 Θ0 N0 J0

Preflabel: ElectronMass

Qudtentry: http://qudt.org/vocab/constant/ElectronMass

Relations:

- is_a isq.Mass
- is_a metrology.MeasuredConstant

ISQDimensionlessQuantity

IRI: http://emmo.info/emmo/middle/isq#EMMO_a66427d1_9932_4363_9ec5_7d91f2bfda1e

Elucidation: A quantity to which no physical dimension is assigned and with a corresponding unit of measurement in the SI of the unit one.

Dbpediaentry: http://dbpedia.org/page/Dimensionless_quantity

Iupacentry: https://doi.org/10.1351/goldbook.D01742

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: ISQDimensionlessQuantity

Wikipediaentry: https://en.wikipedia.org/wiki/Dimensionless_quantity

Relations:

- is_a isq.ISQDerivedQuantity

ThermodynamicTemperature

IRI: http://emmo.info/emmo/middle/isq#EMMO_affe07e4_e9bc_4852_86c6_69e26182a17f

Elucidation: Thermodynamic temperature is the absolute measure of temperature. It is defined by the third law of thermodynamics in which the theoretically lowest temperature is the null or zero point.

Dbpediaentry: http://dbpedia.org/page/Thermodynamic_temperature

Iupacentry: https://doi.org/10.1351/goldbook.T06321

Physicaldimension: T0 L0 M0 I0 Θ+1 N0 J0

Preflabel: ThermodynamicTemperature

Qudtentry: qudt.org/vocab/quantitykind/ThermodynamicTemperature

Relations:

- is_a isq.ISQBaseQuantity

ISQDerivedQuantity

IRI: http://emmo.info/emmo/middle/isq#EMMO_2946d40b_24a1_47fa_8176_e3f79bb45064

Elucidation: Derived quantities defined in the International System of Quantities (ISQ).

Preflabel: ISQDerivedQuantity

Relations:

- is_a isq.InternationalSystemOfQuantity
- is_a metrology.DerivedQuantity

ElectricCurrent

IRI: http://emmo.info/emmo/middle/isq#EMMO_c995ae70_3b84_4ebb_bcfc_69e6a281bb88

Elucidation: A flow of electric charge.

Dbpediaentry: http://dbpedia.org/page/Electric_current

Iupacentry: https://doi.org/10.1351/goldbook.E01927

Physicaldimension: T0 L0 M0 I+1 Θ0 N0 J0

Preflabel: ElectricCurrent

Qudtentry: http://qudt.org/vocab/quantitykind/ElectricCurrent

Relations:

- is_a isq.ISQBaseQuantity

PlanckConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_76cc4efc_231e_42b4_be83_2547681caed6

Elucidation: The quantum of action. It defines the kg base unit in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?h

Dbpediaentry: http://dbpedia.org/page/Planck_constant

Iupacentry: https://doi.org/10.1351/goldbook.P04685

Physicaldimension: T-1 L+2 M+1 I0 Θ0 N0 J0

Preflabel: PlanckConstant

Qudtentry: http://qudt.org/vocab/constant/PlanckConstant

Relations:

- is_a isq.AngularMomentum
- is_a isq.SIExactConstant

ElectricReactance

IRI: http://emmo.info/emmo/middle/isq#EMMO_92b2fb85_2143_4bc7_bbca_df3e6944bfc1

Altlabel: Reactance

Dbpediaentry: http://dbpedia.org/page/Electrical_reactance

Physicaldimension: T-3 L+2 M+1 I-2 Θ0 N0 J0

Preflabel: ElectricReactance

Qudtentry: http://qudt.org/vocab/quantitykind/Reactance

Relations:

- is_a isq.ElectricResistance

AtomicNumber

IRI: http://emmo.info/emmo/middle/isq#EMMO_07de47e0_6bb6_45b9_b55a_4f238efbb105

Definition: Number of protons in an atomic nucleus.

Dbpediaentry: http://dbpedia.org/page/Atomic_number

Iupacentry: https://doi.org/10.1351/goldbook.A00499

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: AtomicNumber

Qudtentry: http://qudt.org/vocab/quantitykind/AtomicNumber

Relations:

- is_a isq.PureNumberQuantity

BoltzmannConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_ffc7735f_c177_46a4_98e9_a54440d29209

Elucidation: A physical constant relating energy at the individual particle level with temperature. It is the gas constant R divided by the Avogadro constant.

It defines the Kelvin unit in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?k

Dbpediaentry: http://dbpedia.org/page/Boltzmann_constant

Iupacentry: https://doi.org/10.1351/goldbook.B00695

Physicaldimension: T-2 L+2 M+1 I0 Θ-1 N0 J0

Preflabel: BoltzmannConstant

Qudtentry: http://qudt.org/vocab/constant/BoltzmannConstant

Relations:

- is_a isq.Entropy
- is_a isq.SIExactConstant

ElectricResistance

IRI: http://emmo.info/emmo/middle/isq#EMMO_e88f75d6_9a17_4cfc_bdf7_43d7cea5a9a1

Elucidation: Measure of the difficulty to pass an electric current through a material.

Altlabel: Resistance

Dbpediaentry: http://dbpedia.org/page/Electrical_resistance_and_conductance

Iupacentry: https://doi.org/10.1351/goldbook.E01936

Physicaldimension: T-3 L+2 M+1 I-2 Θ0 N0 J0

Preflabel: ElectricResistance

Qudtentry: http://qudt.org/vocab/quantitykind/Resistance

Relations:

- is_a isq.ISQDerivedQuantity

SolidAngle

IRI: http://emmo.info/emmo/middle/isq#EMMO_e7c9f7fd_e534_4441_88fe_1fec6cb20f26

Elucidation: Ratio of area on a sphere to its radius squared.

Dbpediaentry: http://dbpedia.org/page/Solid_angle

Iupacentry: https://doi.org/10.1351/goldbook.S05732

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: SolidAngle

Qudtentry: http://qudt.org/vocab/quantitykind/SolidAngle

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only units-extension.AreaFractionUnit

Enthalpy

IRI: http://emmo.info/emmo/middle/isq#EMMO_4091d5ec_a4df_42b9_a073_9a090839279f

Dbpediaentry: http://dbpedia.org/page/Enthalpy

Iupacentry: https://doi.org/10.1351/goldbook.E02141

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: Enthalpy

Qudtentry: http://qudt.org/vocab/quantitykind/Enthalpy

Relations:

- is_a isq.Energy

Acceleration

IRI: http://emmo.info/emmo/middle/isq#EMMO_e37ac288_aa60_415a_8cb7_c375724ac8e1

Dbpediaentry: http://dbpedia.org/page/Acceleration

Iupacentry: https://doi.org/10.1351/goldbook.A00051

Physicaldimension: T-2 L+1 M0 I0 Θ0 N0 J0

Preflabel: Acceleration

Qudtentry: http://qudt.org/vocab/quantitykind/Acceleration

Relations:

- is_a isq.ISQDerivedQuantity

MassFraction

IRI: http://emmo.info/emmo/middle/isq#EMMO_7c055d65_2929_40e1_af4f_4bf10995ad50

Dbpediaentry: http://dbpedia.org/page/Mass_fraction_(chemistry)

Iupacentry: https://doi.org/10.1351/goldbook.M03722

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/MassFraction

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: MassFraction

Qudtentry: http://qudt.org/vocab/quantitykind/MassFraction

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only units-extension.MassFractionUnit

MagneticFieldStrength

IRI: http://emmo.info/emmo/middle/isq#EMMO_b4895f75_41c8_4fd9_b6d6_4d5f7c99c423

Dbpediaentry: http://dbpedia.org/page/Magnetic_field

Iupacentry: https://doi.org/10.1351/goldbook.M03683

Physicaldimension: T0 L-1 M0 I+1 Θ0 N0 J0

Preflabel: MagneticFieldStrength

Qudtentry: http://qudt.org/vocab/quantitykind/MagneticFieldStrength

Relations:

- is_a isq.ISQDerivedQuantity

RatioQuantity

IRI: http://emmo.info/emmo/middle/isq#EMMO_faab3f84_e475_4a46_af9c_7d249f0b9aef

Elucidation: The class of quantities that are the ratio of two quantities with the same physical dimensionality.

Example: refractive index, volume fraction, fine structure constant

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: RatioQuantity

Relations:

- is_a isq.ISQDimensionlessQuantity

Illuminance

IRI: http://emmo.info/emmo/middle/isq#EMMO_b51fbd00_a857_4132_9711_0ef70e7bdd20

Definition: The total luminous flux incident on a surface, per unit area.

Dbpediaentry: http://dbpedia.org/page/Illuminance

Iupacentry: https://doi.org/10.1351/goldbook.I02941

Physicaldimension: T0 L-2 M0 I0 Θ0 N0 J+1

Preflabel: Illuminance

Qudtentry: http://qudt.org/vocab/quantitykind/Illuminance

Relations:

- is_a isq.ISQDerivedQuantity

Force

IRI: http://emmo.info/emmo/middle/isq#EMMO_1f087811_06cb_42d5_90fb_25d0e7e068ef

Elucidation: Any interaction that, when unopposed, will change the motion of an object.

Dbpediaentry: http://dbpedia.org/page/Force

Iupacentry: https://doi.org/10.1351/goldbook.F02480

Physicaldimension: T-2 L+1 M+1 I0 Θ0 N0 J0

Preflabel: Force

Qudtentry: http://qudt.org/vocab/quantitykind/Force

Relations:

- is_a isq.ISQDerivedQuantity

ChemicalPotential

IRI: http://emmo.info/emmo/middle/isq#EMMO_88fc5d1b_d3ab_4626_b24c_915ebe7400ca

Dbpediaentry: http://dbpedia.org/page/Chemical_potential

Iupacentry: https://doi.org/10.1351/goldbook.C01032

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N-1 J0

Preflabel: ChemicalPotential

Qudtentry: http://qudt.org/vocab/quantitykind/ChemicalPotential

Relations:

- is_a isq.ISQDerivedQuantity

Wavenumber

IRI: http://emmo.info/emmo/middle/isq#EMMO_d859588d_44dc_4614_bc75_5fcd0058acc8

Dbpediaentry: http://dbpedia.org/page/Wavenumber

Iupacentry: https://doi.org/10.1351/goldbook.W06664

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/Wavenumber

Physicaldimension: T0 L-1 M0 I0 Θ0 N0 J0

Preflabel: Wavenumber

Qudtentry: http://qudt.org/vocab/quantitykind/Wavenumber

Relations:

- is_a isq.ReciprocalLength

MassNumber

IRI: http://emmo.info/emmo/middle/isq#EMMO_dc6c8de0_cfc4_4c66_a7dc_8f720e732d54

Definition: Number of nucleons in an atomic nucleus.

Altlabel: AtomicMassNumber

Altlabel: NucleonNumber

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: MassNumber

Qudtentry: http://qudt.org/vocab/quantitykind/MassNumber

Relations:

- is_a isq.PureNumberQuantity

RadiantFlux

IRI: http://emmo.info/emmo/middle/isq#EMMO_e46f3f24_c2ec_4552_8dd4_cfc5c0a89c09

Dbpediaentry: http://dbpedia.org/page/Radiant_flux

Iupacentry: https://doi.org/10.1351/goldbook.R05046

Physicaldimension: T-3 L+2 M+1 I0 Θ0 N0 J0

Preflabel: RadiantFlux

Qudtentry: http://qudt.org/vocab/quantitykind/RadiantFlux

Relations:

- is_a isq.Power

ElementaryCharge

IRI: http://emmo.info/emmo/middle/isq#EMMO_58a650f0_a638_4743_8439_535a325e5c4c

Elucidation: The magnitude of the electric charge carried by a single electron. It defines the base unit Ampere in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?e

Dbpediaentry: http://dbpedia.org/page/Elementary_charge

Iupacentry: https://doi.org/10.1351/goldbook.E02032

Physicaldimension: T+1 L0 M0 I+1 Θ0 N0 J0

Preflabel: ElementaryCharge

Qudtentry: http://qudt.org/vocab/quantitykind/ElementaryCharge

Relations:

- is_a isq.ElectricCharge
- is_a isq.SIExactConstant

Capacitance

IRI: http://emmo.info/emmo/middle/isq#EMMO_99dba333_0dbd_4f75_8841_8c0f97fd58e2

Elucidation: The derivative of the electric charge of a system with respect to the electric potential.

Altlabel: ElectricCapacitance

Dbpediaentry: http://dbpedia.org/page/Capacitance

Iupacentry: https://doi.org/10.1351/goldbook.C00791

Physicaldimension: T+4 L-2 M-1 I+2 Θ0 N0 J0

Preflabel: Capacitance

Qudtentry: http://qudt.org/vocab/quantitykind/Capacitance

Relations:

- is_a isq.ISQDerivedQuantity

Stress

IRI: http://emmo.info/emmo/middle/isq#EMMO_d1917609_db5e_4b8a_9b76_ef1d6f860a81

Dbpediaentry: http://dbpedia.org/page/Stress_(mechanics)

Physicaldimension: T-2 L-1 M+1 I0 Θ0 N0 J0

Preflabel: Stress

Qudtentry: http://qudt.org/vocab/quantitykind/Stress

Relations:

- is_a isq.ISQDerivedQuantity

PotentialEnergy

IRI: http://emmo.info/emmo/middle/isq#EMMO_4c151909_6f26_4ef9_b43d_7c9e9514883a

Elucidation: The energy possessed by a body by virtue of its position or orientation in a potential field.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-03-48

Dbpediaentry: http://dbpedia.org/page/Potential_energy

Iupacentry: https://doi.org/10.1351/goldbook.P04778

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/PotentialEnergy

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: PotentialEnergy

Qudtentry: http://qudt.org/vocab/quantitykind/PotentialEnergy

Relations:

- is_a isq.Energy

LuminousIntensity

IRI: http://emmo.info/emmo/middle/isq#EMMO_50bf79a6_a48b_424d_9d2c_813bd631231a

Elucidation: A measure of the wavelength-weighted power emitted by a light source in a particular direction per unit solid angle. It is based on the luminosity function, which is a standardized model of the sensitivity of the human eye.

Dbpediaentry: http://dbpedia.org/page/Luminous_intensity

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J+1

Preflabel: LuminousIntensity

Qudtentry: http://qudt.org/vocab/quantitykind/Length

Relations:

- is_a isq.ISQBaseQuantity

ElectricCharge

IRI: http://emmo.info/emmo/middle/isq#EMMO_1604f495_328a_4f28_9962_f4cc210739dd

Elucidation: The physical property of matter that causes it to experience a force when placed in an electromagnetic field.

Altlabel: Charge

Dbpediaentry: http://dbpedia.org/page/Electric_charge

Iupacentry: https://doi.org/10.1351/goldbook.E01923

Physicaldimension: T+1 L0 M0 I+1 Θ0 N0 J0

Preflabel: ElectricCharge

Qudtentry: http://qudt.org/vocab/quantitykind/ElectricCharge

Relations:

- is_a isq.ISQDerivedQuantity

Speed

IRI: http://emmo.info/emmo/middle/isq#EMMO_81369540_1b0e_471b_9bae_6801af22800e

Dbpediaentry: http://dbpedia.org/page/Speed

Iupacentry: https://doi.org/10.1351/goldbook.S05852

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/Speed

Physicaldimension: T-1 L+1 M0 I0 Θ0 N0 J0

Preflabel: Speed

Qudtentry: http://qudt.org/vocab/quantitykind/Speed

Relations:

- is_a isq.ISQDerivedQuantity

Length

IRI: http://emmo.info/emmo/middle/isq#EMMO_cd2cd0de_e0cc_4ef1_b27e_2e88db027bac

Elucidation: Extend of a spatial dimension.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-01-19

Dbpediaentry: http://dbpedia.org/page/Length

Iupacentry: https://doi.org/10.1351/goldbook.L03498

Physicaldimension: T0 L+1 M0 I0 Θ0 N0 J0

Preflabel: Length

Relations:

- is_a isq.ISQBaseQuantity

VolumeFraction

IRI: http://emmo.info/emmo/middle/isq#EMMO_a8eb87b5_4d10_4137_a75c_e04ee59ca095

Elucidation: Volume of a constituent of a mixture divided by the sum of volumes of all constituents prior to mixing.

Dbpediaentry: http://dbpedia.org/page/Volume_fraction

Iupacentry: https://doi.org/10.1351/goldbook.V06643

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/VolumeFraction

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: VolumeFraction

Qudtentry: http://qudt.org/vocab/quantitykind/VolumeFraction

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only units-extension.VolumeFractionUnit

Permeability

IRI: http://emmo.info/emmo/middle/isq#EMMO_09663630_1b84_4202_91e6_e641104f579e

Altlabel: ElectromagneticPermeability

Dbpediaentry: http://dbpedia.org/page/Permeability_(electromagnetism)

Iupacentry: https://doi.org/10.1351/goldbook.P04503

Physicaldimension: T-2 L+1 M+1 I-2 Θ0 N0 J0

Preflabel: Permeability

Qudtentry: http://qudt.org/vocab/quantitykind/ElectromagneticPermeability

Relations:

- is_a isq.ISQDerivedQuantity

MagneticFluxDensity

IRI: http://emmo.info/emmo/middle/isq#EMMO_961d1aba_f75e_4411_aaa4_457f7516ed6b

Elucidation: Strength of the magnetic field.

Dbpediaentry: http://dbpedia.org/page/Magnetic_field

Iupacentry: https://doi.org/10.1351/goldbook.M03686

Physicaldimension: T-2 L0 M+1 I-1 Θ0 N0 J0

Preflabel: MagneticFluxDensity

Qudtentry: http://qudt.org/vocab/quantitykind/MagneticFluxDensity

Relations:

- is_a isq.ISQDerivedQuantity

Vergence

IRI: http://emmo.info/emmo/middle/isq#EMMO_1e7603a7_1365_49b8_b5e5_3711c8e6b904

Dbpediaentry: http://dbpedia.org/page/Vergence

Physicaldimension: T0 L-1 M0 I0 Θ0 N0 J0

Preflabel: Vergence

Relations:

- is_a isq.ISQDerivedQuantity

Momentum

IRI: http://emmo.info/emmo/middle/isq#EMMO_43776fc9_d712_4571_85f0_72183678039a

Dbpediaentry: http://dbpedia.org/page/Momentum

Iupacentry: https://doi.org/10.1351/goldbook.M04007

Physicaldimension: T-1 L+1 M+1 I0 Θ0 N0 J0

Preflabel: Momentum

Qudtentry: http://qudt.org/vocab/quantitykind/Momentum

Relations:

- is_a isq.ISQDerivedQuantity

ElectricConductivity

IRI: http://emmo.info/emmo/middle/isq#EMMO_cde4368c_1d4d_4c94_8548_604749523c6d

Altlabel: Conductivity

Dbpediaentry: http://dbpedia.org/page/Electrical_resistivity_and_conductivity

Iupacentry: https://doi.org/10.1351/goldbook.C01245

Physicaldimension: T+3 L-3 M-1 I+2 Θ0 N0 J0

Preflabel: ElectricConductivity

Qudtentry: http://qudt.org/vocab/quantitykind/ElectricConductivity

Relations:

- is_a isq.ISQDerivedQuantity

PhysicalQuantity

IRI: http://emmo.info/emmo/middle/metrology#EMMO_02c0621e_a527_4790_8a0f_2bb51973c819

Elucidation: A 'Mathematical' entity that is made of a 'Numeral' and a 'MeasurementUnit' defined by a physical law, connected to a physical entity through a model perspective. Measurement is done according to the same model.

Preflabel: PhysicalQuantity

Relations:

- is_a math.Mathematical
- is_a metrology.Quantity
- metrology.hasReferenceUnit only metrology.MeasurementUnit
- disjoint_union_of metrology.DerivedQuantity, metrology.BaseQuantity

AmountFraction

IRI: http://emmo.info/emmo/middle/isq#EMMO_04b3300c_98bd_42dc_a3b5_e6c29d69f1ac

Definition: The amount of a constituent divided by the total amount of all constituents in a mixture.

Altlabel: MoleFraction

Dbpediaentry: http://dbpedia.org/page/Mole_fraction

Iupacentry: https://doi.org/10.1351/goldbook.A00296

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/AmountOfSubstanceFraction

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: AmountFraction

Qudtentry: http://qudt.org/vocab/quantitykind/MoleFraction

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only units-extension.AmountFractionUnit

HyperfineTransitionFrequencyOfCs

IRI: http://emmo.info/emmo/middle/isq#EMMO_f96feb3f_4438_4e43_aa44_7458c4d87fc2

Elucidation: The frequency standard in the SI system in which the photon absorption by transitions between the two hyperfine ground states of caesium-133 atoms are used to control the output frequency.

It defines the base unit second in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?nucs

Physicaldimension: T-1 L0 M0 I0 Θ0 N0 J0

Preflabel: HyperfineTransitionFrequencyOfCs

Relations:

- is_a isq.Frequency
- is_a isq.SIExactConstant

Weight

IRI: http://emmo.info/emmo/middle/isq#EMMO_04cf0295_3e8f_4693_a87f_3130d125cf05

Dbpediaentry: http://dbpedia.org/page/Weight

Iupacentry: https://doi.org/10.1351/goldbook.W06668

Physicaldimension: T-2 L+1 M+1 I0 Θ0 N0 J0

Preflabel: Weight

Qudtentry: http://qudt.org/vocab/quantitykind/Weight

Relations:

- is_a isq.Force

ElectronCharge

IRI: http://emmo.info/emmo/middle/isq#EMMO_cc01751d_dd05_429b_9d0c_1b7a74d1f277

Definition: The charge of an electron.

Iupacentry: https://doi.org/10.1351/goldbook.E01982

Physicaldimension: T+1 L0 M0 I+1 Θ0 N0 J0

Preflabel: ElectronCharge

Relations:

- is_a isq.ElectricCharge
- is_a isq.SIExactConstant

CelsiusTemperature

IRI: http://emmo.info/emmo/middle/isq#EMMO_66bc9029_f473_45ff_bab9_c3509ff37a22

Elucidation: An objective comparative measure of hot or cold.

Temperature is a relative quantity that can be used to express temperature differences. Unlike ThermodynamicTemperature, it cannot express absolute temperatures.

Dbpediaentry: http://dbpedia.org/page/Temperature

Iupacentry: https://doi.org/10.1351/goldbook.T06261

Physicaldimension: T-1 L0 M0 I0 Θ0 N+1 J0

Preflabel: CelsiusTemperature

Relations:

- is_a isq.ISQDerivedQuantity

VacuumMagneticPermeability

IRI: http://emmo.info/emmo/middle/isq#EMMO_de021e4f_918f_47ef_a67b_11120f56b9d7

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?mu0

Physicaldimension: T-2 L+1 M+1 I-2 Θ0 N0 J0

Preflabel: VacuumMagneticPermeability

Qudtentry: http://qudt.org/vocab/constant/ElectromagneticPermeabilityOfVacuum

Relations:

- is_a isq.Permeability
- is_a metrology.MeasuredConstant

VacuumElectricPermittivity

IRI: http://emmo.info/emmo/middle/isq#EMMO_61a32ae9_8200_473a_bd55_59a9899996f4

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?ep0

Iupacentry: https://doi.org/10.1351/goldbook.P04508

Physicaldimension: T+4 L-3 M-1 I+2 Θ0 N0 J0

Preflabel: VacuumElectricPermittivity

Qudtentry: http://qudt.org/vocab/constant/PermittivityOfVacuum

Relations:

- is_a isq.Permittivity
- is_a metrology.MeasuredConstant

Energy

IRI: http://emmo.info/emmo/middle/isq#EMMO_31ec09ba_1713_42cb_83c7_b38bf6f9ced2

Elucidation: A property of objects which can be transferred to other objects or converted into different forms.

Dbpediaentry: http://dbpedia.org/page/Energy

Iupacentry: https://doi.org/10.1351/goldbook.E02101

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: Energy

Qudtentry: http://qudt.org/vocab/quantitykind/Energy

Relations:

- is_a isq.ISQDerivedQuantity

RybergConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_a3c78d6f_ae49_47c8_a634_9b6d86b79382

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?ryd

Dbpediaentry: http://dbpedia.org/page/Rydberg_constant

Iupacentry: https://doi.org/10.1351/goldbook.R05430

Physicaldimension: T0 L-1 M0 I0 Θ0 N0 J0

Preflabel: RybergConstant

Qudtentry: http://qudt.org/vocab/constant/RydbergConstant

Relations:

- is_a isq.Wavenumber
- is_a metrology.MeasuredConstant

ProtonMass

IRI: http://emmo.info/emmo/middle/isq#EMMO_8d689295_7d84_421b_bc01_d5cceb2c2086

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?mp

Iupacentry: https://doi.org/10.1351/goldbook.P04914

Physicaldimension: T0 L0 M+1 I0 Θ0 N0 J0

Preflabel: ProtonMass

Qudtentry: http://qudt.org/vocab/constant/ProtonMass

Relations:

- is_a isq.Mass
- is_a metrology.MeasuredConstant

KineticEnergy

IRI: http://emmo.info/emmo/middle/isq#EMMO_ac540a9d_0131_43f6_a33b_17e5cfc432ed

Elucidation: The energy of an object due to its motion.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-03-49

Dbpediaentry: http://dbpedia.org/page/Kinetic_energy

Iupacentry: https://doi.org/10.1351/goldbook.K03402

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/KineticEnergy

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: KineticEnergy

Qudtentry: http://qudt.org/vocab/quantitykind/KineticEnergy

Relations:

- is_a isq.Energy

AreaDensity

IRI: http://emmo.info/emmo/middle/isq#EMMO_afea89af_ef16_4bdb_99d5_f3b2f4c85a6c

Dbpediaentry: http://dbpedia.org/page/Area_density

Iupacentry: https://doi.org/10.1351/goldbook.S06167

Physicaldimension: T0 L-2 M+1 I0 Θ0 N0 J0

Preflabel: AreaDensity

Relations:

- is_a isq.ISQDerivedQuantity

Entropy

IRI: http://emmo.info/emmo/middle/isq#EMMO_9bbab0be_f9cc_4f46_9f46_0fd271911b79

Dbpediaentry: http://dbpedia.org/page/Entropy

Iupacentry: https://doi.org/10.1351/goldbook.E02149

Physicaldimension: T-2 L+2 M+1 I0 Θ-1 N0 J0

Preflabel: Entropy

Qudtentry: http://qudt.org/vocab/quantitykind/Entropy

Relations:

- is_a isq.ISQDerivedQuantity

InternalEnergy

IRI: http://emmo.info/emmo/middle/isq#EMMO_830b59f7_d047_438c_90cd_62845749efcb

Elucidation: A state quantity equal to the difference between the total energy of a system and the sum of the macroscopic kinetic and potential energies of the system.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-04-20

Altlabel: ThermodynamicEnergy

Dbpediaentry: http://dbpedia.org/page/Internal_energy

Iupacentry: https://doi.org/10.1351/goldbook.I03103

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/InternalEnergy

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: InternalEnergy

Qudtentry: http://qudt.org/vocab/quantitykind/InternalEnergy

Relations:

- is_a isq.Energy

AmountConcentration

IRI: http://emmo.info/emmo/middle/isq#EMMO_d5be1faf_0c56_4f5a_9b78_581e6dee949f

Altlabel: Concentration

Altlabel: MolarConcentration

Altlabel: Molarity

Dbpediaentry: http://dbpedia.org/page/Molar_concentration

Iupacentry: https://doi.org/10.1351/goldbook.A00295

Physicaldimension: T0 L-3 M0 I0 Θ0 N+1 J0

Preflabel: AmountConcentration

Qudtentry: http://qudt.org/vocab/quantitykind/AmountOfSubstanceConcentrationOfB

Relations:

- is_a isq.ISQDerivedQuantity

Volume

IRI: http://emmo.info/emmo/middle/isq#EMMO_f1a51559_aa3d_43a0_9327_918039f0dfed

Dbpediaentry: http://dbpedia.org/page/Volume

Physicaldimension: T0 L-3 M0 I0 Θ0 N0 J0

Preflabel: Volume

Qudtentry: http://qudt.org/vocab/quantitykind/Volume

Relations:

- is_a isq.ISQDerivedQuantity

MassConcentration

IRI: http://emmo.info/emmo/middle/isq#EMMO_16f2fe60_2db7_43ca_8fee_5b3e416bfe87

Dbpediaentry: http://dbpedia.org/page/Mass_concentration_(chemistry)

Iupacentry: https://doi.org/10.1351/goldbook.M03713

Physicaldimension: T0 L-3 M+1 I0 Θ0 N0 J0

Preflabel: MassConcentration

Qudtentry: http://qudt.org/vocab/quantitykind/MassConcentration

Relations:

- is_a isq.Density

AmountOfSubstance

IRI: http://emmo.info/emmo/middle/isq#EMMO_8159c26a_494b_4fa0_9959_10888f152298

Elucidation: The number of elementary entities present.

Dbpediaentry: http://dbpedia.org/page/Amount_of_substance

Iupacentry: https://doi.org/10.1351/goldbook.A00297

Physicaldimension: T0 L0 M0 I0 Θ0 N+1 J0

Preflabel: AmountOfSubstance

Qudtentry: http://qudt.org/vocab/quantitykind/AmountOfSubstance

Relations:

- is_a isq.ISQBaseQuantity

Velocity

IRI: http://emmo.info/emmo/middle/isq#EMMO_0329f1f5_8339_4ce4_8505_a264c6d606ba

Definition: Vector quantity giving the rate of change of a position vector.

– ISO 80000-3

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-01-32

Iso80000ref: 3-10.1

Physicaldimension: T-1 L+1 M0 I0 Θ0 N0 J0

Preflabel: Velocity

Qudtentry: http://qudt.org/vocab/quantitykind/Velocity

Relations:

- is_a isq.Speed

Time

IRI: http://emmo.info/emmo/middle/isq#EMMO_d4f7d378_5e3b_468a_baa1_a7e98358cda7

Definition: One-dimensional subspace of space-time, which is locally orthogonal to space.

Elucidation: The indefinite continued progress of existence and events that occur in apparently irreversible succession from the past through the present to the future.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-01-03

Dbpediaentry: http://dbpedia.org/page/Time

Iupacentry: https://doi.org/10.1351/goldbook.T06375

Physicaldimension: T+1 L0 M0 I0 Θ0 N0 J0

Preflabel: Time

Qudtentry: qudt.org/vocab/quantitykind/Time

Relations:

- is_a isq.ISQBaseQuantity

Power

IRI: http://emmo.info/emmo/middle/isq#EMMO_09b9021b_f97b_43eb_b83d_0a764b472bc2

Elucidation: Rate of transfer of energy per unit time.

Dbpediaentry: http://dbpedia.org/page/Power_(physics)

Iupacentry: https://doi.org/10.1351/goldbook.P04792

Physicaldimension: T-3 L+2 M+1 I0 Θ0 N0 J0

Preflabel: Power

Qudtentry: http://qudt.org/vocab/quantitykind/Power

Relations:

- is_a isq.ISQDerivedQuantity

MagneticDipoleMoment

IRI: http://emmo.info/emmo/middle/isq#EMMO_81e767f1_59b1_4d7a_bf69_17f322241831

Elucidation: Vector quantity μ causing a change to its energy ΔW in an external magnetic field of field flux density B:

`$\Updelta$W = -$\upmu$ · B`

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=121-11-55

Iso80000ref: 10-9.1

Dbpediaentry: http://dbpedia.org/page/Magnetic_moment

Iupacentry: http://goldbook.iupac.org/terms/view/M03688

Physicaldimension: T0 L+2 M0 I+1 Θ0 N0 J0

Preflabel: MagneticDipoleMoment

Qudtentry: http://qudt.org/vocab/quantitykind/MagneticDipoleMoment

Relations:

- is_a isq.ISQDerivedQuantity

Area

IRI: http://emmo.info/emmo/middle/isq#EMMO_96f39f77_44dc_491b_8fa7_30d887fe0890

Dbpediaentry: http://dbpedia.org/page/Area

Iupacentry: https://doi.org/10.1351/goldbook.A00429

Physicaldimension: T0 L+2 M0 I0 Θ0 N0 J0

Preflabel: Area

Qudtentry: http://qudt.org/vocab/quantitykind/Area

Relations:

- is_a isq.ISQDerivedQuantity

VonKlitzingConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_eb561764_276e_413d_a8cb_3a3154fd9bf8

Definition: The von Klitzing constant is defined as Planck constant divided by the square of the elementary charge.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?rk

Physicaldimension: T-3 L+2 M+1 I-2 Θ0 N0 J0

Preflabel: VonKlitzingConstant

Qudtentry: http://qudt.org/vocab/constant/VonKlitzingConstant

Relations:

- is_a isq.ElectricResistance
- is_a isq.SIExactConstant

AtomicMass

IRI: http://emmo.info/emmo/middle/isq#EMMO_27367073_ed8a_481a_9b07_f836dfe31f7f

Definition: The mass of an atom in the ground state.

Iupacentry: https://doi.org/10.1351/goldbook.A00496

Physicaldimension: T0 L0 M+1 I0 Θ0 N0 J0

Preflabel: AtomicMass

Wikipediaentry: https://en.wikipedia.org/wiki/Atomic_mass

Relations:

- is_a isq.Mass

PositionVector

IRI: http://emmo.info/emmo/middle/isq#EMMO_44da6d75_54a4_4aa8_bd3a_156f6e9abb8e

Definition: Vector r characterizing a point P in a point space with a given origin point O.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-03-12

Altlabel: Position

Physicaldimension: T0 L+1 M0 I0 Θ0 N0 J0

Preflabel: PositionVector

Relations:

- is_a isq.Length

CurrentDensity

IRI: http://emmo.info/emmo/middle/isq#EMMO_7c8007b0_58a7_4486_bf1c_4772852caca0

Dbpediaentry: http://dbpedia.org/page/Current_density

Iupacentry: https://doi.org/10.1351/goldbook.E01928

Physicaldimension: T0 L-2 M0 I+1 Θ0 N0 J0

Preflabel: CurrentDensity

Qudtentry: http://qudt.org/vocab/quantitykind/ElectricCurrentDensity

Relations:

- is_a isq.ISQDerivedQuantity

ISQBaseQuantity

IRI: http://emmo.info/emmo/middle/isq#EMMO_1a4c1a97_88a7_4d8e_b2f9_2ca58e92dde4

Elucidation: Base quantities defined in the International System of Quantities (ISQ).

Preflabel: ISQBaseQuantity

Wikipediaentry: https://en.wikipedia.org/wiki/International_System_of_Quantities

Relations:

- is_a isq.InternationalSystemOfQuantity
- is_a metrology.BaseQuantity
- disjoint_union_of isq.LuminousIntensity, isq.AmountOfSubstance, isq.ThermodynamicTemperature, isq.ElectricCurrent, isq.Length, isq.Time, isq.Mass

InternationalSystemOfQuantity

IRI: http://emmo.info/emmo/middle/isq#EMMO_f35cff4d_dc09_44cf_a729_22fb79e3bfb2

Elucidation: Quantities declared under the ISO 80000.

Preflabel: InternationalSystemOfQuantity

Wikipediaentry: https://en.wikipedia.org/wiki/International_System_of_Quantities

Relations:

- is_a metrology.PhysicalQuantity

ElectricConductance

IRI: http://emmo.info/emmo/middle/isq#EMMO_ffb73b1e_5786_43e4_a964_cb32ac7affb7

Elucidation: Measure of the ease for electric current to pass through a material.

Altlabel: Conductance

Dbpediaentry: http://dbpedia.org/page/Electrical_resistance_and_conductance

Iupacentry: https://doi.org/10.1351/goldbook.E01925

Physicaldimension: T+3 L-2 M-1 I+2 Θ0 N0 J0

Preflabel: ElectricConductance

Qudtentry: http://qudt.org/vocab/quantitykind/Conductance

Relations:

- is_a isq.ISQDerivedQuantity

AngularMomentum

IRI: http://emmo.info/emmo/middle/isq#EMMO_66d01570_36dd_42fd_844d_29b81b029cd5

Dbpediaentry: http://dbpedia.org/page/Angular_momentum

Iupacentry: https://doi.org/10.1351/goldbook.A00353

Physicaldimension: T-1 L+2 M+1 I0 Θ0 N0 J0

Preflabel: AngularMomentum

Qudtentry: http://qudt.org/vocab/quantitykind/AngularMomentum

Relations:

- is_a isq.ISQDerivedQuantity

Density

IRI: http://emmo.info/emmo/middle/isq#EMMO_06448f64_8db6_4304_8b2c_e785dba82044

Dbpediaentry: http://dbpedia.org/page/Density

Iupacentry: https://doi.org/10.1351/goldbook.D01590

Physicaldimension: T0 L-3 M+1 I0 Θ0 N0 J0

Preflabel: Density

Qudtentry: http://qudt.org/vocab/quantitykind/Density

Relations:

- is_a isq.ISQDerivedQuantity

AbsorbedDose

IRI: http://emmo.info/emmo/middle/isq#EMMO_8e5dd473_808b_4a8a_b7cd_63068c12ff57

Definition: Energy imparted to matter by ionizing radiation in a suitable small element of volume divided by the mass of that element of volume.

Dbpediaentry: http://dbpedia.org/page/Absorbed_dose

Iupacentry: https://doi.org/10.1351/goldbook.A00031

Physicaldimension: T-2 L+2 M0 I0 Θ0 N0 J0

Preflabel: AbsorbedDose

Qudtentry: http://qudt.org/vocab/quantitykind/AbsorbedDose

Relations:

- is_a isq.ISQDerivedQuantity

Heat

IRI: http://emmo.info/emmo/middle/isq#EMMO_12d4ba9b_2f89_4ea3_b206_cd376f96c875

Iupacentry: https://doi.org/10.1351/goldbook.H02752

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: Heat

Qudtentry: http://qudt.org/vocab/quantitykind/Heat

Relations:

- is_a isq.Energy

Work

IRI: http://emmo.info/emmo/middle/isq#EMMO_624d72ee_e676_4470_9434_c22b4190d3d5

Definition: Product of force and displacement.

Dbpediaentry: http://dbpedia.org/page/Heat

Dbpediaentry: http://dbpedia.org/page/Work_(physics)

Iupacentry: https://doi.org/10.1351/goldbook.W06684

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: Work

Qudtentry: http://qudt.org/vocab/quantitykind/Work

Relations:

- is_a isq.Energy

ElectricResistivity

IRI: http://emmo.info/emmo/middle/isq#EMMO_e150fa8d_06dc_4bb8_bf95_04e2aea529c1

Altlabel: Resistivity

Dbpediaentry: http://dbpedia.org/page/Electrical_resistivity_and_conductivity

Iupacentry: https://doi.org/10.1351/goldbook.R05316

Physicaldimension: T-3 L+3 M+1 I-2 Θ0 N0 J0

Preflabel: ElectricResistivity

Qudtentry: http://qudt.org/vocab/quantitykind/Resistivity

Relations:

- is_a isq.ISQDerivedQuantity

MagneticFlux

IRI: http://emmo.info/emmo/middle/isq#EMMO_3b931698_937e_49be_ab1b_36fa52d91181

Elucidation: Measure of magnetism, taking account of the strength and the extent of a magnetic field.

Dbpediaentry: http://dbpedia.org/page/Magnetic_flux

Iupacentry: https://doi.org/10.1351/goldbook.M03684

Physicaldimension: T-2 L+2 M+1 I-1 Θ0 N0 J0

Preflabel: MagneticFlux

Qudtentry: http://qudt.org/vocab/quantitykind/MagneticFlux

Relations:

- is_a isq.ISQDerivedQuantity

RefractiveIndex

IRI: http://emmo.info/emmo/middle/isq#EMMO_5eedba4d_105b_44d8_b1bc_e33606276ea2

Dbpediaentry: http://dbpedia.org/page/Refractive_index

Iupacentry: https://doi.org/10.1351/goldbook.R05240

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: RefractiveIndex

Qudtentry: http://qudt.org/vocab/quantitykind/RefractiveIndex

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only units-extension.SpeedFractionUnit

CentreOfMass

IRI: http://emmo.info/emmo/middle/isq#EMMO_9d8f708a_f291_4d72_80ec_362c6e6bbca6

Elucidation: The unique point where the weighted relative position of the distributed mass of an Item sums to zero. Equivalently, it is the point where if a force is applied to the Item, causes the Item to move in direction of force without rotation.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-03-12

Dbpediaentry: http://dbpedia.org/page/Center_of_mass

Physicaldimension: T0 L+1 M0 I0 Θ0 N0 J0

Preflabel: CentreOfMass

Wikipediaentry: https://en.wikipedia.org/wiki/Center_of_mass

Relations:

- is_a isq.PositionVector

Angle

IRI: http://emmo.info/emmo/middle/isq#EMMO_f3dd74c0_f480_49e8_9764_33b78638c235

Definition: Ratio of circular arc length to radius.

Altlabel: PlaneAngle

Dbpediaentry: http://dbpedia.org/page/Angle

Iupacentry: https://doi.org/10.1351/goldbook.A00346

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: Angle

Qudtentry: http://qudt.org/vocab/quantitykind/PlaneAngle

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only units-extension.LengthFractionUnit

ElectricPotential

IRI: http://emmo.info/emmo/middle/isq#EMMO_4f2d3939_91b1_4001_b8ab_7d19074bf845

Elucidation: Energy required to move a unit charge through an electric field from a reference point.

Altlabel: Voltage

Dbpediaentry: http://dbpedia.org/page/Voltage

Iupacentry: https://doi.org/10.1351/goldbook.A00424

Physicaldimension: T-3 L+2 M+1 I-1 Θ0 N0 J0

Preflabel: ElectricPotential

Qudtentry: http://qudt.org/vocab/quantitykind/Voltage

Relations:

- is_a isq.ISQDerivedQuantity

Mass

IRI: http://emmo.info/emmo/middle/isq#EMMO_ed4af7ae_63a2_497e_bb88_2309619ea405

Elucidation: Property of a physical body that express its resistance to acceleration (a change in its state of motion) when a force is applied.

Dbpediaentry: http://dbpedia.org/page/Mass

Iupacentry: https://doi.org/10.1351/goldbook.M03709

Physicaldimension: T0 L0 M+1 I0 Θ0 N0 J0

Preflabel: Mass

Qudtentry: http://qudt.org/vocab/quantitykind/Mass

Relations:

- is_a isq.ISQBaseQuantity
- Inverse(properties.hasProperty) only physicalistic.Matter

ElectricInductance

IRI: http://emmo.info/emmo/middle/isq#EMMO_04cc9451_5306_45d0_8554_22cee4d6e785

Elucidation: A property of an electrical conductor by which a change in current through it induces an electromotive force in both the conductor itself and in any nearby conductors by mutual inductance.

Altlabel: Inductance

Dbpediaentry: http://dbpedia.org/page/Inductance

Iupacentry: https://doi.org/10.1351/goldbook.M04076

Physicaldimension: T-2 L+2 M+1 I-2 Θ0 N0 J0

Preflabel: ElectricInductance

Qudtentry: http://qudt.org/vocab/quantitykind/Inductance

Relations:

- is_a isq.ISQDerivedQuantity

Probability

IRI: http://emmo.info/emmo/middle/isq#EMMO_0a88be81_343d_4388_92c1_09228ff95ada

Elucidation: Probability is a dimensionless quantity that can attain values between 0 and 1; zero denotes the impossible event and 1 denotes a certain event.

Iupacentry: https://doi.org/10.1351/goldbook.P04855

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: Probability

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only metrology.UnitOne

Luminance

IRI: http://emmo.info/emmo/middle/isq#EMMO_97589322_710c_4af4_9431_1e5027f2be42

Dbpediaentry: http://dbpedia.org/page/Luminance

Iupacentry: https://doi.org/10.1351/goldbook.L03640

Physicaldimension: T0 L-2 M0 I0 Θ0 N0 J+1

Preflabel: Luminance

Qudtentry: http://qudt.org/vocab/quantitykind/Luminance

Relations:

- is_a isq.ISQDerivedQuantity

Number branch

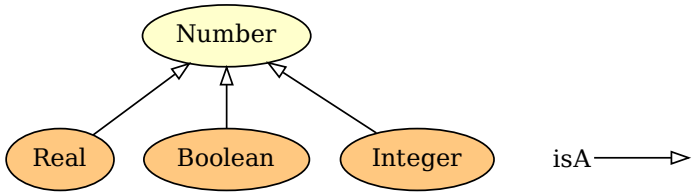


Figure 3.24: Number branch.

Real

IRI: http://emmo.info/emmo/middle/math#EMMO_18d180e4_5e3e_42f7_820c_e08951223486

Preflabel: Real

Relations:

- is_a math.Number
- math.hasNumericalData only type
- math.hasNumericalData exactly 1 type
- equivalent_to math.hasNumericalData some type

Boolean

IRI: http://emmo.info/emmo/middle/math#EMMO_54dc83cb_06e1_4739_9e45_bc09cead7f48

Preflabel: Boolean

Relations:

- is_a math.Number
- math.hasNumericalData only type
- math.hasNumericalData exactly 1 type
- equivalent_to math.hasNumericalData some type

Integer

IRI: http://emmo.info/emmo/middle/math#EMMO_f8bd64d5_5d3e_4ad4_a46e_c30714fecb7f

Preflabel: Integer

Relations:

- is_a math.Number

- math.hasNumericalData only type
- math.hasNumericalData exactly 1 type
- equivalent_to math.hasNumericalData some type

Number

IRI: http://emmo.info/emmo/middle/math#EMMO_21f56795_ee72_4858_b571_11cfaa59c1a8

Elucidation: A numerical data value.

Preflabel: Number

Relations:

- is_a math.Numerical
- is_a math.MathematicalSymbol
- is_a perceptual.Symbol

Measurement Unit branch

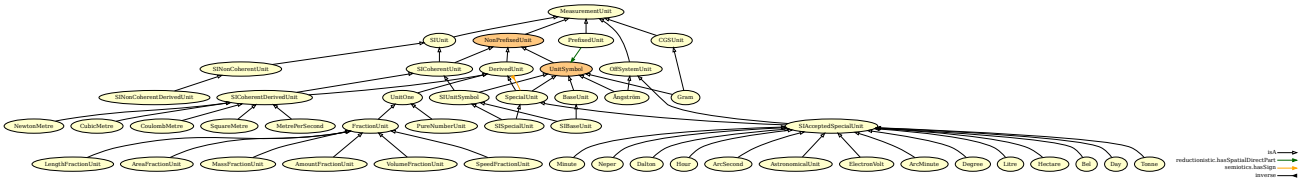


Figure 3.25: Measurement Unit branch.

Steradian

IRI: http://emmo.info/emmo/middle/siunits#EMMO_cf3dd6cc_c5d6_4b3d_aef4_82f3b7a361af

Elucidation: Dimensionless measurement unit for solid angle.

Iupacentry: https://doi.org/10.1351/goldbook.S05971

Preflabel: Steradian

Qudtentry: http://qudt.org/vocab/unit/SR

Relations:

- is_a siunits.SISpecialUnit
- is_a units-extension.AreaFractionUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “sr”

BaseUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_db716151_6b73_45ff_910c_d182fdcbb4f5

Elucidation: A set of units that correspond to the base quantities in a system of units.

Preflabel: BaseUnit

Relations:

- is_a metrology.UnitSymbol

NewtonMetre

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_c10b7090_7284_4719_8e15_c743b13ca6ad

Elucidation: SI coherent measurement unit for torque.

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/newtonMetre

Preflabel: NewtonMetre

Qudtentry: http://qudt.org/vocab/unit/N-M

Relations:

- is_a siunits.SICoherentDerivedUnit
- metrology.hasPhysicalDimension some isq.EnergyDimension

LengthFractionUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_cdc962d8_f3ea_4764_a57a_c7caa4859179

Elucidation: Unit for quantities of dimension one that are the fraction of two lengths.

Example: Unit for plane angle.

Preflabel: LengthFractionUnit

Relations:

- is_a units-extension.FractionUnit

AreaFractionUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_6f4d704a_a7c6_4c07_b8a7_ea0bab04128f

Elucidation: Unit for quantities of dimension one that are the fraction of two areas.

Example: Unit for solid angle.

Preflabel: AreaFractionUnit

Relations:

- is_a units-extension.FractionUnit

Hectare

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_d6eb0176_a0d7_4b4e_8df0_50e912be2342

Definition: A non-SI metric unit of area defined as the square with 100-metre sides.

Dbpediaentry: http://dbpedia.org/page/Hectare

Preflabel: Hectare

Qudtentry: http://qudt.org/vocab/unit/HA

Wikipediaentry: https://en.wikipedia.org/wiki/Hectare

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.AreaDimension
- perceptual.hasSymbolData value “ha”

Bel

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_6c7160fc_cc64_46f0_b43b_aba65e9952e3

Definition: One bel is defined as ½ `ln(10) neper`.

Elucidation: Unit of measurement for quantities of type level or level difference.

Preflabel: Bel

Qudtentry: http://qudt.org/vocab/unit/B

Wikipediaentry: https://en.wikipedia.org/wiki/Decibel

Relations:

- is_a units-extension.SIAcceptedSpecialUnit

- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “B”

MassFractionUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_18448443_dcf1_49b8_a321_cf46e2c393e1

Elucidation: Unit for quantities of dimension one that are the fraction of two masses.

Example: Unit for mass fraction.

Preflabel: MassFractionUnit

Relations:

- is_a units-extension.FractionUnit

CubicMetre

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_a055d311_9990_40a5_b2f2_288412f5d6a5

Elucidation: SI coherent measurement unit for volume.

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/cubicMetre

Preflabel: CubicMetre

Qudtentry: http://qudt.org/vocab/unit/M3

Relations:

- is_a siunits.SICoherentDerivedUnit
- metrology.hasPhysicalDimension some isq.VolumeDimension

Day

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_28ef05a7_ecc1_4df6_8116_c53251fbd4a8

Definition: A measure of time defined as 86 400 seconds.

Dbpediaentry: http://dbpedia.org/page/Day

Iupacentry: https://doi.org/10.1351/goldbook.D01527

Preflabel: Day

Qudtentry: http://qudt.org/vocab/unit/DAY

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.TimeDimension
- perceptual.hasSymbolData value “d”

Tonne

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_f8b92999_3cde_46e3_99d5_664da3090a02

Definition: A non-SI unit defined as 1000 kg.

Iupacentry: https://doi.org/10.1351/goldbook.T06394

Preflabel: Tonne

Qudtentry: http://qudt.org/vocab/unit/TON_M

Wikipediaentry: https://en.wikipedia.org/wiki/Tonne

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit

- metrology.hasPhysicalDimension some isq.MassDimension
- perceptual.hasSymbolData value “t”

Minute

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_cabb20f0_05c7_448f_9485_e129725f15a4

Definition: Non-SI time unit defined as 60 seconds.

Dbpediaentry: http://dbpedia.org/page/Minute

Preflabel: Minute

Qudtentry: http://qudt.org/vocab/unit/MIN

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.TimeDimension
- perceptual.hasSymbolData value “min”

AmountFractionUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_f76f5a24_d703_4e8c_b368_f9a7777cb73a

Elucidation: Unit for quantities of dimension one that are the fraction of two amount of substance.

Example: Unit for amount fraction.

Preflabel: AmountFractionUnit

Relations:

- is_a units-extension.FractionUnit

PureNumberUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_15d62b55_38ea_4aec_b7c4_25db1a2e5a01

Elucidation: Unit for dimensionless units that cannot be expressed as a ‘FractionUnit’.

Example: Unit of AtomicNumber

Preflabel: PureNumberUnit

Relations:

- is_a metrology.UnitOne

Neper

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_b41515a9_28d8_4d78_8165_74b2fc72f89e

Definition: Unit of measurement for quantities of type level or level difference, which are defined as the natural logarithm of the ratio of power- or field-type quantities.

The value of a ratio in nepers is given by `ln(x1/x2)` where `x1` and `x2` are the values of interest (amplitudes), and ln is the natural logarithm. When the values are quadratic in the amplitude (e.g. power), they are first linearised by taking the square root before the logarithm is taken, or equivalently the result is halved.

Wikipedia

Dbpediaentry: http://dbpedia.org/page/Neper

Iupacentry: https://doi.org/10.1351/goldbook.N04106

Preflabel: Neper

Qudtentry: http://qudt.org/vocab/unit/NP

Wikipediaentry: https://en.wikipedia.org/wiki/Neper

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “Np”

SIUnitSymbol

IRI: http://emmo.info/emmo/middle/siunits#EMMO_32129fb5_df25_48fd_a29c_18a2f22a2dd5

Preflabel: SIUnitSymbol

Relations:

- is_a metrology.UnitSymbol
- is_a siunits.SICoherentUnit
- disjoint_union_of siunits.SIBaseUnit, siunits.SISpecialUnit

UnitOne

IRI: http://emmo.info/emmo/middle/metrology#EMMO_5ebd5e01_0ed3_49a2_a30d_cd05cbe72978

Elucidation: Represents the number 1, used as an explicit unit to say something has no units.

Example: Refractive index or volume fraction.

Example: Typically used for ratios of two units whos dimensions cancels out.

Preflabel: UnitOne

Qudtentry: http://qudt.org/vocab/unit/UNITLESS

Relations:

- is_a metrology.DerivedUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne

Radian

IRI: http://emmo.info/emmo/middle/siunits#EMMO_a121bb1d_5225_4c78_809b_0268c3012208

Elucidation: Measure of plane angle.

Iupacentry: https://doi.org/10.1351/goldbook.R05036

Preflabel: Radian

Qudtentry: http://qudt.org/vocab/unit/RAD

Relations:

- is_a siunits.SISpecialUnit
- is_a units-extension.LengthFractionUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “rad”

Dalton

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_00dd79e0_31a6_427e_9b9c_90f3097e4a96

Definition: One dalton is defined as one twelfth of the mass of an unbound neutral atom of carbon-12 in its nuclear and electronic ground state.

Dbpediaentry: http://dbpedia.org/page/Unified_atomic_mass_unit

Iupacentry: https://doi.org/10.1351/goldbook.D01514

Preflabel: Dalton

Qudtentry: http://qudt.org/vocab/unit/Dalton

Relations:

- is_a units-extension.SIAcceptedSpecialUnit

- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.MassDimension
- perceptual.hasSymbolData value “Da”

SINonCoherentUnit

IRI: http://emmo.info/emmo/middle/siunits#EMMO_8246541a_f1f6_4d03_8bd7_fc6b76d17375

Preflabel: SINonCoherentUnit

Relations:

- is_a siunits.SIUnit
- disjoint_union_of siunits.SINonCoherentDerivedUnit, siunits.SIPrefixedUnit

SIUnit

IRI: http://emmo.info/emmo/middle/siunits#EMMO_feb03a8a_bbb6_4918_a891_46713ef557f4

Elucidation: The set of units provided by the SI referring to the ISQ.

Preflabel: SIUnit

Relations:

- is_a metrology.MeasurementUnit
- disjoint_union_of siunits.SICoherentDerivedUnit, siunits.SIBaseUnit, siunits.SINonCoherentDerivedUnit, siunits.SIPrefixedUnit, siunits.SISpecialUnit

CGSUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_52e4cb25_da39_45e2_a6db_063ec5730499

Elucidation: The centimetre–gram–second (CGS) system of units.

Preflabel: CGSUnit

Wikipediaentry: https://en.wikipedia.org/wiki/Centimetre%E2%80%93gram%E2%80%93second_system_of_units

Relations:

- is_a metrology.MeasurementUnit

SICoherentDerivedUnit

IRI: http://emmo.info/emmo/middle/siunits#EMMO_1273eb34_de48_43a9_925f_104110469dd2

Elucidation: A SI derived unit whos numerical factor in front of the product of SI base units is one.

Example: m/s kg/m^3

Preflabel: SICoherentDerivedUnit

Relations:

- is_a metrology.DerivedUnit
- is_a siunits.SICoherentUnit

NonPrefixedUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_868ae137_4d25_493e_b270_21ea3d94849e

Elucidation: A measurement unit symbol that do not have a metric prefix as a direct spatial part.

Preflabel: NonPrefixedUnit

Relations:

- is_a metrology.MeasurementUnit
- reductionistic.hasSpatialDirectPart only not metrology.MetricPrefix
- equivalent_to metrology.DerivedUnit or metrology.UnitSymbol

OffSystemUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_591e02fd_8d37_45a6_9d11_bb21cef391a0

Elucidation: A unit that does not belong to any system of units.

Example: eV barn

Preflabel: OffSystemUnit

Relations:

- is_a metrology.MeasurementUnit

VolumeFractionUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_9fd1e79d_41d1_44f8_8142_66dbdf0fc7ad

Elucidation: Unit for quantities of dimension one that are the fraction of two volumes.

Example: Unit for volume fraction.

Preflabel: VolumeFractionUnit

Relations:

- is_a units-extension.FractionUnit

CoulombMetre

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_e9eaeeb5_620c_4dab_8f72_269ff85d0634

Elucidation: Measurement unit for electric dipole moment.

Preflabel: CoulombMetre

Relations:

- is_a siunits.SICoherentDerivedUnit
- metrology.hasPhysicalDimension some isq.MagneticDipoleMomentDimension

SpecialUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_3ee80521_3c23_4dd1_935d_9d522614a3e2

Elucidation: A unit symbol that stands for a derived unit.

Example: Pa stands for N/m2 J stands for N m

Preflabel: SpecialUnit

Relations:

- is_a metrology.DerivedUnit
- is_a metrology.UnitSymbol
- is_a semiotics.Sign
- Inverse(semiotics.hasSign) some metrology.DerivedUnit

Hour

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_21ef2ed6_c086_4d24_8a75_980d2bcc9282

Definition: Measure of time defined as 3600 seconds.

Iupacentry: https://doi.org/10.1351/goldbook.H02866

Preflabel: Hour

Qudtentry: http://qudt.org/vocab/unit/HR

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit

- metrology.hasPhysicalDimension some isq.TimeDimension
- perceptual.hasSymbolData value “h”

SIAcceptedSpecialUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_6795a4b8_ffd0_4588_a581_a9413fe49cac

Elucidation: Non-SI units mentioned in the SI.

Preflabel: SIAcceptedSpecialUnit

Wikipediaentry: https://en.wikipedia.org/wiki/Non-SI_units_mentioned_in_the_SI

Relations:

- is_a metrology.SpecialUnit
- is_a metrology.OffSystemUnit
- disjoint_union_of units-extension.Dalton, units-extension.AstronomicalUnit, units-extension.ArcMinute, units-extension.Hour, units-extension.Day, units-extension.ArcSecond, units-extension.Bel, units-extension.Litre, units-extension.Neper, units-extension.Degree, units-extension.Minute, units-extension.Hectare, units-extension.ElectronVolt, units-extension.Tonne

SquareMetre

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_b0d1c460_d06b_4c7f_8832_148bc1c8e7dc

Elucidation: SI coherent measurement unit for area.

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/squareMetre

Preflabel: SquareMetre

Qudtentry: http://qudt.org/vocab/unit/M2

Relations:

- is_a siunits.SICoherentDerivedUnit
- metrology.hasPhysicalDimension some isq.AreaDimension

SINonCoherentDerivedUnit

IRI: http://emmo.info/emmo/middle/siunits#EMMO_60b78cc3_6011_4134_95ab_956f56d4bdc1

Elucidation: A derived unit whos numerical factor in front of the product of base units is NOT equal to one.

Preflabel: SINonCoherentDerivedUnit

Relations:

- is_a siunits.SINonCoherentUnit

ArcSecond

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_6a4547ab_3abb_430d_b81b_ce32d47729f5

Definition: Measure of plane angle defined as 1/3600 or a degree.

Altlabel: SecondOfArc

Preflabel: ArcSecond

Qudtentry: http://qudt.org/vocab/unit/ARCSEC

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “ ”

AstronomicalUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_053648ea_3c0a_468c_89cb_eb009239323a

Definition: One astronomical unit is defined as exactly 149597870700 m, which is roughly the distance from earth to sun.

Dbpediaentry: http://dbpedia.org/page/Astronomical_unit

Preflabel: AstronomicalUnit

Qudtentry: http://qudt.org/vocab/unit/PARSEC

Wikipediaentry: https://en.wikipedia.org/wiki/Astronomical_unit

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.LengthDimension
- perceptual.hasSymbolData value “au”

MetrePerSecond

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_4a27950a_0d31_4175_bd4e_14995aa94702

Elucidation: SI coherent measurement unit for speed.

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/metrePerSecond-Time

Preflabel: MetrePerSecond

Qudtentry: http://qudt.org/vocab/unit/M-PER-SEC

Relations:

- is_a siunits.SICoherentDerivedUnit
- metrology.hasPhysicalDimension some isq.VelocityDimension

UnitSymbol

IRI: http://emmo.info/emmo/middle/metrology#EMMO_216f448e_cdbc_4aeb_a529_7a5fe7fc38bb

Elucidation: A symbol that stands for a single unit.

Example: Some examples are “Pa”, “m” and “J”.

Preflabel: UnitSymbol

Relations:

- is_a metrology.MetrologicalSymbol
- is_a metrology.NonPrefixedUnit
- equivalent_to metrology.MeasurementUnit and perceptual.Symbol
- disjoint_union_of metrology.SpecialUnit, metrology.BaseUnit

ElectronVolt

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_e29f84db_4c1c_46ae_aa38_c4d47536b972

Definition: The amount of energy gained (or lost) by the charge of a single electron moving across an electric potential difference of one volt.

Dbpediaentry: http://dbpedia.org/page/Electronvolt

Iupacentry: https://doi.org/10.1351/goldbook.E02014

Preflabel: ElectronVolt

Qudtentry: http://qudt.org/vocab/unit/EV

Relations:

- is_a units-extension.SIAcceptedSpecialUnit

- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.EnergyDimension
- perceptual.hasSymbolData value “eV”

SpeedFractionUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_e7bc8939_7ff8_4917_beb5_c42730b390f3

Elucidation: Unit for quantities of dimension one that are the fraction of two speeds.

Example: Unit for refractive index.

Preflabel: SpeedFractionUnit

Relations:

- is_a units-extension.FractionUnit

ArcMinute

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_1e0b665d_db6c_4752_a6d4_262d3a8dbb46

Definition: Measure of plane angle defined as 1/60 or a degree.

Altlabel: MinuteOfArc

Preflabel: ArcMinute

Qudtentry: http://qudt.org/vocab/unit/ARCMIN

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “ ”

SIPrefixedUnit

IRI: http://emmo.info/emmo/middle/siunits#EMMO_d41ce84b_4317_41fb_a5d1_6cd281fca106

Elucidation: A SI base or special unit with a metric prefix.

Preflabel: SIPrefixedUnit

Relations:

- is_a metrology.PrefixedUnit
- is_a siunits.SINonCoherentUnit

Degree

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_b8830065_3809_41b7_be3c_e33795567fd9

Definition: Degree is a measurement of plane angle, defined by representing a full rotation as 360 degrees.

Dbpediaentry: http://dbpedia.org/page/Degree_(angle)

Iupacentry: https://doi.org/10.1351/goldbook.D01560

Preflabel: Degree

Qudtentry: http://qudt.org/vocab/unit/DEG

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “°”

FractionUnit

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_c2f5ee66_579c_44c6_a2e9_fa2eaa9fa4da

Elucidation: Unit for fractions of quantities of the same kind, to aid the understanding of the quantity being expressed.

Preflabel: FractionUnit

Relations:

- is_a metrology.UnitOne

Litre

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_a155dc93_d266_487e_b5e7_2a2c72d5ebf9

Definition: A non-SI unit of volume defined as 1 cubic decimetre (dm3),

Iupacentry: https://doi.org/10.1351/goldbook.L03594

Preflabel: Litre

Qudtentry: http://qudt.org/vocab/unit/L

Relations:

- is_a units-extension.SIAcceptedSpecialUnit
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.VolumeDimension
- perceptual.hasSymbolData value “l”

Gram

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_f992dc76_f9a6_45f6_8873_c8e20d16fbbe

Definition: Gram is defined as one thousandth of the SI unit kilogram.

Iupacentry: https://doi.org/10.1351/goldbook.G02680

Preflabel: Gram

Qudtentry: http://qudt.org/vocab/unit/GM

Wikipediaentry: https://en.wikipedia.org/wiki/Gram

Relations:

- is_a metrology.UnitSymbol
- is_a units-extension.CGSUnit
- metrology.hasPhysicalDimension some isq.MassDimension
- perceptual.hasSymbolData value “g”

SICoherentUnit

IRI: http://emmo.info/emmo/middle/siunits#EMMO_707c6032_e272_4a20_98b5_d35c4f67be68

Preflabel: SICoherentUnit

Relations:

- is_a metrology.NonPrefixedUnit
- is_a siunits.SIUnit
- disjoint_union_of siunits.SICoherentDerivedUnit, siunits.SIBaseUnit, siunits.SISpecialUnit

DerivedUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_08b308d4_31cd_4779_a784_aa92fc730f39

Elucidation: Derived units are defined as products of powers of the base units corresponding to the relations defining the derived quantities in terms of the base quantities.

Preflabel: DerivedUnit

Relations:

- is_a metrology.NonPrefixedUnit

Ångström

IRI: http://emmo.info/emmo/middle/units-extension#EMMO_27c530c4_dfcd_486e_b324_54ad4448cd26

Definition: Measure of length defined as 1e-10 metres.

Altlabel: Angstrom

Dbpediaentry: http://dbpedia.org/page/%C3%85ngstr%C3%B6m

Iupacentry: https://doi.org/10.1351/goldbook.N00350

Preflabel: Ångström

Qudtentry: http://qudt.org/vocab/unit/ANGSTROM

Wikipediaentry: https://en.wikipedia.org/wiki/Angstrom

Relations:

- is_a metrology.UnitSymbol
- is_a metrology.OffSystemUnit
- metrology.hasPhysicalDimension some isq.LengthDimension
- perceptual.hasSymbolData value "Å"

MeasurementUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_b081b346_7279_46ef_9a3d_2c088fcd79f4

Elucidation: A 'Quantity' that stands for the standard reference magnitude of a specific class of measurement processes, defined and adopted by convention or by law.

The numerical quantity value of the 'MeasurementUnit' is conventionally 1 and does not appear.

Quantitative measurement results are expressed as a multiple of the 'MeasurementUnit'.

Preflabel: MeasurementUnit

Relations:

- is_a metrology.ReferenceUnit
- is_a semiotics.Object
- metrology.hasPhysicalDimension exactly 1 metrology.PhysicalDimension
- disjoint_union_of metrology.NonPrefixedUnit, metrology.PrefixedUnit

UTF8 branch

Figure 3.26: UTF8 branch.

UTF8

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_e13b2173_1dec_4b97_9ac1_1dc4b418612a

Preflabel: UTF8

Relations:

- is_a perceptual.Symbol

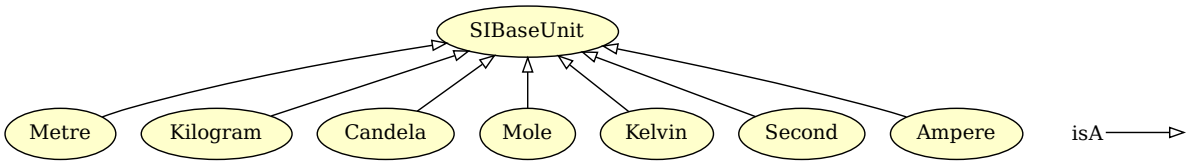


Figure 3.27: SI Base Unit branch.

SI Base Unit branch

SIBaseUnit

IRI: http://emmo.info/emmo/middle/siunits#EMMO_3a185e6c_9e19_4776_b583_19c978156aa0

Elucidation: The base units in the SI system.

Preflabel: SIBaseUnit

Relations:

- is_a metrology.BaseUnit
- is_a siunits.SIUnitSymbol
- disjoint_union_of siunits.Kelvin, siunits.Second, siunits.Metre, siunits.Candela, siunits.Kilogram, siunits.Ampere, siunits.Mole

Metre

IRI: http://emmo.info/emmo/middle/siunits#EMMO_7db11dbf_a643_464a_9b56_07eabcc3e9c5

Definition: The metre, symbol m, is the SI unit of length. It is defined by taking the fixed numerical value of the speed of light in vacuum c to be 299792458 when expressed in the unit m s-1, where the second is defined in terms of $\nabla\nu$Cs.

Iupacentry: https://doi.org/10.1351/goldbook.M03884

Preflabel: Metre

Qudtentry: http://qudt.org/vocab/unit/M

Relations:

- is_a siunits.SIBaseUnit
- metrology.hasPhysicalDimension some isq.LengthDimension
- perceptual.hasSymbolData value “m”

Kilogram

IRI: http://emmo.info/emmo/middle/siunits#EMMO_9bfd6f1e_b0ce_459c_beb7_8f1f41708bba

Definition: The kilogram, symbol kg, is the SI unit of mass. It is defined by taking the fixed numerical value of the Planck constant h to be 6.62607015×10-34 when expressed in the unit J s, which is equal to kg m2 s-1, where the metre and the second are defined in terms of c and $\nabla\nu$Cs.

Iupacentry: https://doi.org/10.1351/goldbook.K03391

Preflabel: Kilogram

Qudtentry: http://qudt.org/vocab/unit/KiloGM

Relations:

- is_a siunits.SIBaseUnit
- metrology.hasPhysicalDimension some isq.MassDimension
- perceptual.hasSymbolData value “kg”

Candela

IRI: http://emmo.info/emmo/middle/siunits#EMMO_8d00f093_3f45_4ea3_986c_b3545c3c2f4c

Definition: The candela, symbol cd, is the SI unit of luminous intensity in a given direction. It is defined by taking the fixed numerical value of the luminous efficacy of monochromatic radiation of frequency 540×1012 Hz, Kcd, to be 683 when expressed in the unit lm W-1, which is equal to cd sr W-1, or cd sr kg-1 m-2 s3, where the kilogram, metre and second are defined in terms of h, c and ∇νCs.

Iupacentry: https://doi.org/10.1351/goldbook.C00787

Preflabel: Candela

Qudtentry: http://qudt.org/vocab/unit/CD

Relations:

- is_a siunits.SIBaseUnit
- metrology.hasPhysicalDimension some isq.LuminousIntensityDimension
- perceptual.hasSymbolData value “cd”

Mole

IRI: http://emmo.info/emmo/middle/siunits#EMMO_df6eeb01_1b41_4bd8_9257_a04fbd7cf000

Definition: The mole, symbol mol, is the SI unit of amount of substance. One mole contains exactly 6.022 140 76 × 1023 elementary entities. This number is the fixed numerical value of the Avogadro constant, NA, when expressed in the unit mol-1 and is called the Avogadro number. The amount of substance, symbol n, of a system is a measure of the number of specified elementary entities. An elementary entity may be an atom, a molecule, an ion, an electron, any other particle or specified group of particles.

Iupacentry: https://doi.org/10.1351/goldbook.M03980

Preflabel: Mole

Qudtentry: http://qudt.org/vocab/unit/MOL

Relations:

- is_a siunits.SIBaseUnit
- metrology.hasPhysicalDimension some isq.AmountDimension
- perceptual.hasSymbolData value “mol”

Kelvin

IRI: http://emmo.info/emmo/middle/siunits#EMMO_2e5e45fc_f52c_4294_bdc2_5ed7a06dfce7

Definition: The kelvin, symbol K, is the SI unit of thermodynamic temperature. It is defined by taking the fixed numerical value of the Boltzmann constant k to be 1.380649×10-23 when expressed in the unit J K-1, which is equal to kg m2 s-2 K-1, where the kilogram, metre and second are defined in terms of h, c and ∇νCs.

Iupacentry: https://doi.org/10.1351/goldbook.K03374

Preflabel: Kelvin

Qudtentry: http://qudt.org/vocab/unit/K

Relations:

- is_a siunits.SIBaseUnit
- metrology.hasPhysicalDimension some isq.TemperatureDimension
- perceptual.hasSymbolData value “K”

Second

IRI: http://emmo.info/emmo/middle/siunits#EMMO_314ba716_2d3d_4462_9a4f_d3419ae1df43

Definition: The second, symbol s, is the SI unit of time. It is defined by taking the fixed numerical value of the caesium frequency ∇νCs, the unperturbed ground-state hyperfine transition frequency of the caesium 133 atom, to be 9192631770 when expressed in the unit Hz, which is equal to s-1.

Iupacentry: https://doi.org/10.1351/goldbook.S05513

Preflabel: Second

Qudtentry: http://qudt.org/vocab/unit/SEC

Relations:

- is_a siunits.SIBaseUnit
- metrology.hasPhysicalDimension some isq.TimeDimension
- perceptual.hasSymbolData value “s”

Ampere

IRI: http://emmo.info/emmo/middle/siunits#EMMO_db5dd38d_ac79_4af6_8782_fee7e7150ae8

Definition: The ampere, symbol A, is the SI unit of electric current. It is defined by taking the fixed numerical value of the elementary charge e to be 1.602176634×10-19 when expressed in the unit C, which is equal to A s, where the second is defined in terms of $\nabla\nu$Cs.

Iupacentry: https://doi.org/10.1351/goldbook.A00300

Preflabel: Ampere

Qudtentry: http://qudt.org/vocab/unit/A

Relations:

- is_a siunits.SIBaseUnit
- metrology.hasPhysicalDimension some isq.ElectricCurrentDimension
- perceptual.hasSymbolData value “A”

SI Special Unit branch

Ohm

IRI: http://emmo.info/emmo/middle/siunits#EMMO_59c10c5c_47bd_4348_ba39_38836607dfa1

Iupacentry: https://doi.org/10.1351/goldbook.O04280

Preflabel: Ohm

Qudtentry: http://qudt.org/vocab/unit/OHM

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.ElectricResistanceDimension
- perceptual.hasSymbolData value “Ω”

Farad

IRI: http://emmo.info/emmo/middle/siunits#EMMO_a9201b2f_e6de_442a_b3a6_d292a5820bc5

Iupacentry: https://doi.org/10.1351/goldbook.F02320

Preflabel: Farad

Qudtentry: http://qudt.org/vocab/unit/FARAD

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.CapacitanceDimension
- perceptual.hasSymbolData value “F”

Steradian

IRI: http://emmo.info/emmo/middle/siunits#EMMO_cf3dd6cc_c5d6_4b3d_aef4_82f3b7a361af

Elucidation: Dimensionless measurement unit for solid angle.

Iupacentry: https://doi.org/10.1351/goldbook.S05971

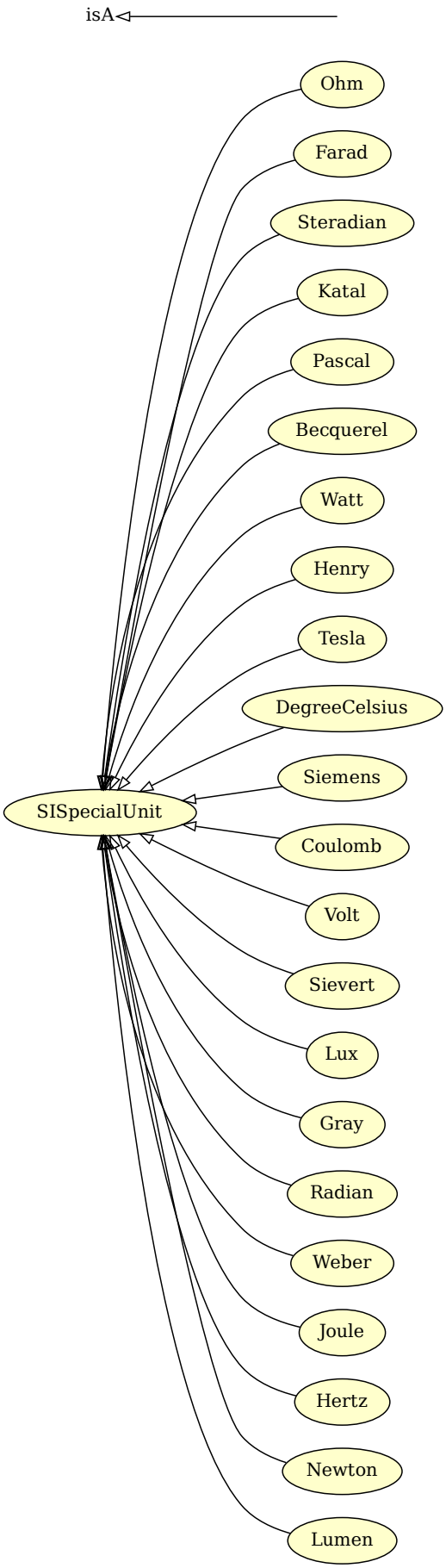


Figure 3.28: SI Special Unit branch.

Preflabel: Steradian

Qudtentry: http://qudt.org/vocab/unit/SR

Relations:

- is_a siunits.SISpecialUnit
- is_a units-extension.AreaFractionUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “sr”

Katal

IRI: http://emmo.info/emmo/middle/siunits#EMMO_33b67e69_3645_4c73_b100_5ea6759221b4

Iupacentry: https://doi.org/10.1351/goldbook.K03372

Preflabel: Katal

Qudtentry: http://qudt.org/vocab/unit/KAT

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.CatalyticActivityDimension
- perceptual.hasSymbolData value “kat”

Pascal

IRI: http://emmo.info/emmo/middle/siunits#EMMO_a80dc6f5_b1aa_41a7_a3a8_cd5040da2162

Iupacentry: https://doi.org/10.1351/goldbook.P04442

Preflabel: Pascal

Qudtentry: http://qudt.org/vocab/unit/PA

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.PressureDimension
- perceptual.hasSymbolData value “Pa”

Becquerel

IRI: http://emmo.info/emmo/middle/siunits#EMMO_b71e4ba5_8f73_4199_8c96_7ea7f94d9e2a

Definition: Radioactive decays per second.

Iupacentry: https://doi.org/10.1351/goldbook.B00624

Preflabel: Becquerel

Qudtentry: http://qudt.org/vocab/unit/BQ

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.FrequencyDimension
- perceptual.hasSymbolData value “Bq”

Watt

IRI: http://emmo.info/emmo/middle/siunits#EMMO_080052a1_f295_44be_a60f_1326ce13f1ba

Iupacentry: https://doi.org/10.1351/goldbook.W06656

Preflabel: Watt

Qudtentry: http://qudt.org/vocab/unit/W

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.PowerDimension
- perceptual.hasSymbolData value “W”

Henry

IRI: http://emmo.info/emmo/middle/siunits#EMMO_fab003c8_f7a6_4346_9988_7161325ed7a3

Iupacentry: https://doi.org/10.1351/goldbook.H02782

Preflabel: Henry

Qudtentry: http://qudt.org/vocab/unit/H

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.InductanceDimension
- perceptual.hasSymbolData value “H”

Tesla

IRI: http://emmo.info/emmo/middle/siunits#EMMO_acb50123_87a2_4753_b36c_f87114ad4de2

Iupacentry: https://doi.org/10.1351/goldbook.T06283

Preflabel: Tesla

Qudtentry: http://qudt.org/vocab/unit/T

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.MagneticFluxDensityDimension
- perceptual.hasSymbolData value “T”

DegreeCelsius

IRI: http://emmo.info/emmo/middle/siunits#EMMO_b20be325_8bfd_4237_bee7_201ab0fd9c75

Iupacentry: https://doi.org/10.1351/goldbook.D01561

Preflabel: DegreeCelsius

Qudtentry: http://qudt.org/vocab/unit/DEG_C

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.TemperatureDimension
- perceptual.hasSymbolData value “°C”

Siemens

IRI: http://emmo.info/emmo/middle/siunits#EMMO_f2523820_04a6_44ab_bb67_8237dda2b0c2

Preflabel: Siemens

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.ElectricConductanceDimension
- perceptual.hasSymbolData value “S”

Coulomb

IRI: http://emmo.info/emmo/middle/siunits#EMMO_696ed548_9477_45ea_993c_6a8f5271914a

Iupacentry: https://doi.org/10.1351/goldbook.C01365

Preflabel: Coulomb

Qudtentry: http://qudt.org/vocab/unit/C

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.ElectricChargeDimension
- perceptual.hasSymbolData value “C”

Volt

IRI: http://emmo.info/emmo/middle/siunits#EMMO_e2207e91_02b0_4a8a_b13e_61d2a2a839f1

Iupacentry: https://doi.org/10.1351/goldbook.V06634

Preflabel: Volt

Qudtentry: http://qudt.org/vocab/unit/V

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.ElectricPotentialDimension
- perceptual.hasSymbolData value “V”

Sievert

IRI: http://emmo.info/emmo/middle/siunits#EMMO_dc232f53_8ed8_4ddd_9f41_cc057985eadb

Iupacentry: https://doi.org/10.1351/goldbook.S05658

Preflabel: Sievert

Qudtentry: http://qudt.org/vocab/unit/SV

Wikipediaentry: https://en.wikipedia.org/wiki/Equivalent_dose

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.AbsorbedDoseDimension
- perceptual.hasSymbolData value “Sv”

Lux

IRI: http://emmo.info/emmo/middle/siunits#EMMO_da1dd4a7_c611_4ad4_bef6_7646f28aa598

Iupacentry: https://doi.org/10.1351/goldbook.L03651

Preflabel: Lux

Qudtentry: http://qudt.org/vocab/unit/LUX

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.IlluminanceDimension
- perceptual.hasSymbolData value “lx”

Gray

IRI: http://emmo.info/emmo/middle/siunits#EMMO_00199e76_69dc_45b6_a9c6_98cc90cdc0f5

Iupacentry: https://doi.org/10.1351/goldbook.G02696

Preflabel: Gray

Qudtentry: http://qudt.org/vocab/unit/GRAY

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.AbsorbedDoseDimension
- perceptual.hasSymbolData value “Gy”

SISpecialUnit

IRI: http://emmo.info/emmo/middle/siunits#EMMO_e9ffc696_5228_4ff9_8a60_0f5e05e9931b

Elucidation: The 22 derived units that are given a special name in the SI system that stands for units derived by SI base units.

Preflabel: SISpecialUnit

Wikipediaentry: https://en.wikipedia.org/wiki/International_System_of_Units#Derived_units

Relations:

- is_a metrology.SpecialUnit
- is_a siunits.SIUnitSymbol
- disjoint_union_of siunits.Gray, siunits.Watt, siunits.Katal, siunits.Ohm, siunits.Coulomb, siunits.Joule, siunits.Radian, siunits.Pascal, siunits.Farad, siunits.Newton, siunits.Tesla, siunits.DegreeCelsius, siunits.Becquerel, siunits.Steradian, siunits.Lumen, siunits.Weber, siunits.Lux, siunits.Sievert, siunits.Volt, siunits.Hertz, siunits.Siemens, siunits.Henry

Radian

IRI: http://emmo.info/emmo/middle/siunits#EMMO_a121bb1d_5225_4c78_809b_0268c3012208

Elucidation: Measure of plane angle.

Iupacentry: https://doi.org/10.1351/goldbook.R05036

Preflabel: Radian

Qudtentry: http://qudt.org/vocab/unit/RAD

Relations:

- is_a siunits.SISpecialUnit
- is_a units-extension.LengthFractionUnit
- metrology.hasPhysicalDimension some metrology.DimensionOne
- perceptual.hasSymbolData value “rad”

Weber

IRI: http://emmo.info/emmo/middle/siunits#EMMO_d7f11b34_a121_4519_87c0_aa754f1c4737

Iupacentry: https://doi.org/10.1351/goldbook.W06666

Preflabel: Weber

Qudtentry: http://qudt.org/vocab/unit/WB

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.MagneticFluxDimension
- perceptual.hasSymbolData value “Wb”

Joule

IRI: http://emmo.info/emmo/middle/siunits#EMMO_8a70dea4_d6ab_4260_b931_a3e990982416

Iupacentry: https://doi.org/10.1351/goldbook.J03363

Preflabel: Joule

Qudtentry: http://qudt.org/vocab/unit/J

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.EnergyDimension
- perceptual.hasSymbolData value “J”

Hertz

IRI: http://emmo.info/emmo/middle/siunits#EMMO_e75f580e_52bf_4dd5_af70_df409cec08fd

Iupacentry: https://doi.org/10.1351/goldbook.H02785

Preflabel: Hertz

Qudtentry: http://qudt.org/vocab/unit/HZ

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.FrequencyDimension
- perceptual.hasSymbolData value “Hz”

Newton

IRI: http://emmo.info/emmo/middle/siunits#EMMO_a979c531_f9fa_4a6e_93c1_a2960241ca64

Iupacentry: https://doi.org/10.1351/goldbook.N04135

Preflabel: Newton

Qudtentry: http://qudt.org/vocab/unit/N

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.ForceDimension
- perceptual.hasSymbolData value “N”

Lumen

IRI: http://emmo.info/emmo/middle/siunits#EMMO_d7b7fd1e_645a_42cb_8f40_85f0d034d3ae

Iupacentry: https://doi.org/10.1351/goldbook.L03639

Preflabel: Lumen

Qudtentry: http://qudt.org/vocab/unit/LM

Relations:

- is_a siunits.SISpecialUnit
- metrology.hasPhysicalDimension some isq.LuminousIntensityDimension
- perceptual.hasSymbolData value “lm”

Prefixed Unit branch

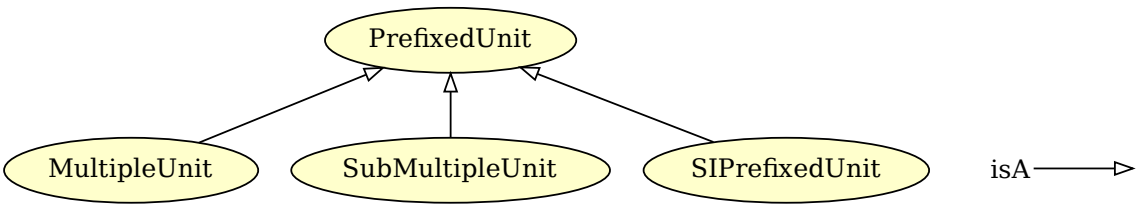


Figure 3.29: Prefixed Unit branch.

MultipleUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_62f0d847_3603_45b4_bfc4_dd4511355ff2

Elucidation: Measurement unit obtained by multiplying a given measurement unit by an integer greater than one.

Preflabel: MultipleUnit

Relations:

- is_a metrology.PrefixedUnit

PrefixedUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_c6d4a5e0_7e95_44df_a6db_84ee0a8bbc8e

Elucidation: A measurement unit that is made of a metric prefix and a unit symbol.

Preflabel: PrefixedUnit

Relations:

- is_a metrology.MeasurementUnit
- is_a reductionistic.State
- reductionistic.hasSpatialDirectPart only (metrology.UnitSymbol or metrology.MetricPrefix)
- reductionistic.hasSpatialDirectPart exactly 1 metrology.UnitSymbol
- reductionistic.hasSpatialDirectPart exactly 1 metrology.MetricPrefix
- disjoint_union_of metrology.MultipleUnit, metrology.SubMultipleUnit

SubMultipleUnit

IRI: http://emmo.info/emmo/middle/metrology#EMMO_a2f94f33_71fa_443c_a1fb_d1685fc537ec

Elucidation: Measurement unit obtained by dividing a given measurement unit by an integer greater than one.

Preflabel: SubMultipleUnit

Relations:

- is_a metrology.PrefixedUnit

SIPrefixedUnit

IRI: http://emmo.info/emmo/middle/siunits#EMMO_d41ce84b_4317_41fb_a5d1_6cd281fca106

Elucidation: A SI base or special unit with a metric prefix.

Preflabel: SIPrefixedUnit

Relations:

- is_a metrology.PrefixedUnit
- is_a siunits.SINonCoherentUnit

Metric Prefix branch

Centi

IRI: http://emmo.info/emmo/middle/siunits#EMMO_b55cd09a_e54d_4eb1_81dd_03c29d1b878e

Preflabel: Centi

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 0.01
- perceptual.hasSymbolData value “c”

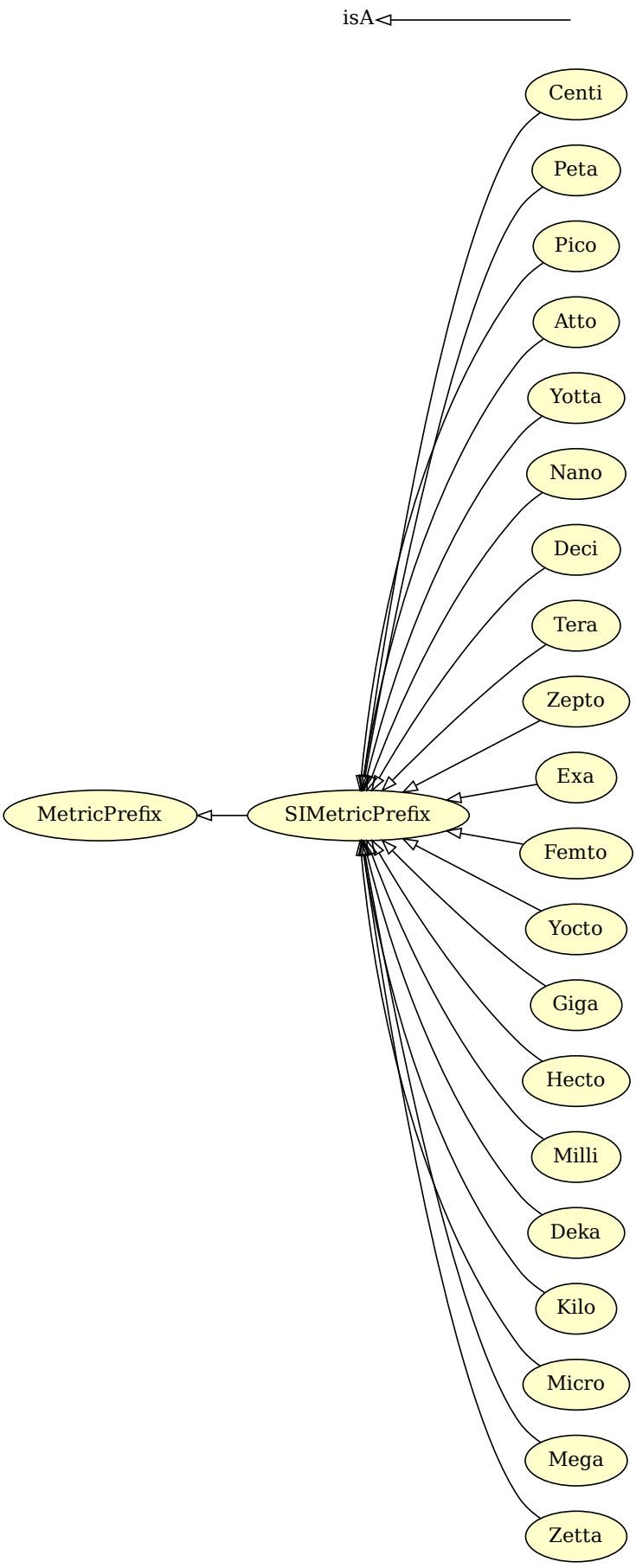


Figure 3.30: Metric Prefix branch.

Peta

IRI: http://emmo.info/emmo/middle/siunits#EMMO_43a6b269_da31_4bb6_a537_c97df4fff32a

Preflabel: Peta

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 1000000000000000.0
- perceptual.hasSymbolData value “P”

Pico

IRI: http://emmo.info/emmo/middle/siunits#EMMO_068c4e58_2470_4b1c_8454_010dd4906100

Preflabel: Pico

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 1e-12
- perceptual.hasSymbolData value “p”

Atto

IRI: http://emmo.info/emmo/middle/siunits#EMMO_42955b2d_b465_4666_86cc_ea3c2d685753

Preflabel: Atto

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 1e-18
- perceptual.hasSymbolData value “a”

Yotta

IRI: http://emmo.info/emmo/middle/siunits#EMMO_e79c62ff_10ad_4ec0_baba_c19ddd4eaa11

Preflabel: Yotta

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 1e+24
- perceptual.hasSymbolData value “Y”

SIMetricPrefix

IRI: http://emmo.info/emmo/middle/siunits#EMMO_471cb92b_edca_4cf9_bce8_a75084d876b8

Preflabel: SIMetricPrefix

Relations:

- is_a metrology.MetricPrefix
- disjoint_union_of siunits.Pico, siunits.Deci, siunits.Deka, siunits.Hecto, siunits.Femto, siunits.Zepto, siunits.Tera, siunits.Atto, siunits.Peta, siunits.Exa, siunits.Mega, siunits.Kilo, siunits.Micro, siunits.Milli, siunits.Giga, siunits.Centi, siunits.Zetta, siunits.Nano, siunits.Yotta, siunits.Yocto

Nano

IRI: http://emmo.info/emmo/middle/siunits#EMMO_e1981c25_7c55_4020_aa7a_d2e14ced86d4

Preflabel: Nano

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 1e-09

- perceptual.hasSymbolData value “n”

Deci

IRI: http://emmo.info/emmo/middle/siunits#EMMO_1181c938_c8f0_4ad6_bc7a_2bfdc0903d29

Preflabel: Deci

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 0.1
- perceptual.hasSymbolData value “d”

Tera

IRI: http://emmo.info/emmo/middle/siunits#EMMO_3a204900_2b33_47d1_b444_815cc4c8cffa

Preflabel: Tera

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 1000000000000.0
- perceptual.hasSymbolData value “T”

Zepto

IRI: http://emmo.info/emmo/middle/siunits#EMMO_254472c6_3dbd_4f02_bc43_571389cd281f

Preflabel: Zepto

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 1e-21
- perceptual.hasSymbolData value “z”

Exa

IRI: http://emmo.info/emmo/middle/siunits#EMMO_5cf9f86c_86f5_40c4_846d_60371f670e0a

Preflabel: Exa

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 1e+18
- perceptual.hasSymbolData value “E”

Femto

IRI: http://emmo.info/emmo/middle/siunits#EMMO_23bfe79a_cade_48f1_9a8c_fd96e6bac8ba

Preflabel: Femto

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 1e-15
- perceptual.hasSymbolData value “f”

Yocto

IRI: http://emmo.info/emmo/middle/siunits#EMMO_f5769206_9257_4b08_bf7b_dad7868c6afc

Preflabel: Yocto

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 1e-24
- perceptual.hasSymbolData value “y”

Giga

IRI: http://emmo.info/emmo/middle/siunits#EMMO_a8eb4bbb_1bd3_4ad4_b114_2789bcbd2134

Preflabel: Giga

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 1000000000.0
- perceptual.hasSymbolData value “G”

Hecto

IRI: http://emmo.info/emmo/middle/siunits#EMMO_21aaefc1_3f86_4208_b7db_a755f31f0f8c

Preflabel: Hecto

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 100.0
- perceptual.hasSymbolData value “h”

Milli

IRI: http://emmo.info/emmo/middle/siunits#EMMO_a3a701ed_6f7d_4a10_9aee_dfa1961fc7b7

Preflabel: Milli

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 0.001
- perceptual.hasSymbolData value “m”

Deka

IRI: http://emmo.info/emmo/middle/siunits#EMMO_1d8b370b_c672_4d0c_964e_eaafcbf2f51f

Preflabel: Deka

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 10.0
- perceptual.hasSymbolData value “da”

Kilo

IRI: http://emmo.info/emmo/middle/siunits#EMMO_74931b1b_c133_4e59_9a75_1bf0e1626201

Preflabel: Kilo

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 1000.0
- perceptual.hasSymbolData value “k”

Micro

IRI: http://emmo.info/emmo/middle/siunits#EMMO_9ff3bf8e_2168_406e_8251_1d158fc948ae

Preflabel: Micro

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 1e-06
- perceptual.hasSymbolData value “μ”

Mega

IRI: http://emmo.info/emmo/middle/siunits#EMMO_5eaecadc_4f0d_4a3a_afc7_1fc0b83cc928

Preflabel: Mega

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 1000000.0
- perceptual.hasSymbolData value “M”

MetricPrefix

IRI: http://emmo.info/emmo/middle/metrology#EMMO_7d2afa66_ae9e_4095_a9bf_421d0be401b6

Elucidation: Dimensionless multiplicative unit prefix.

Preflabel: MetricPrefix

Relations:

- is_a math.MathematicalSymbol
- is_a math.Constant
- is_a metrology.MetrologicalSymbol
- is_a metrology.Metrological
- is_a perceptual.Symbol

Zetta

IRI: http://emmo.info/emmo/middle/siunits#EMMO_daa9ee97_4c5f_42e5_918c_44d7523e8958

Preflabel: Zetta

Relations:

- is_a siunits.SIMetricPrefix
- Inverse(math.hasVariable) only math.hasNumericalData value 1e+21
- perceptual.hasSymbolData value “Z”

Quantity branch

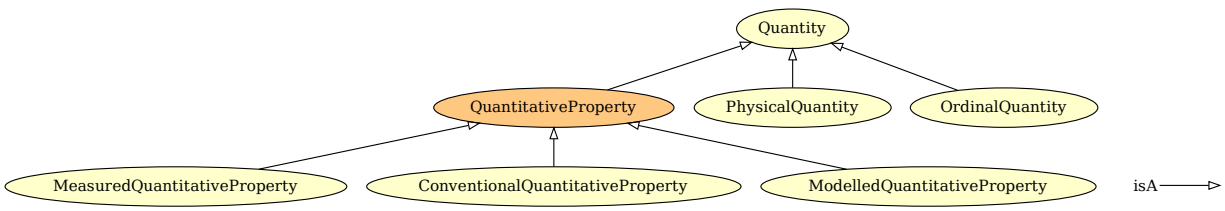


Figure 3.31: Quantity branch.

MeasuredQuantitativeProperty

IRI: http://emmo.info/emmo/middle/properties#EMMO_873b0ab3_88e6_4054_b901_5531e01f14a4

Preflabel: MeasuredQuantitativeProperty

Relations:

- is_a metrology.QuantitativeProperty

QuantitativeProperty

IRI: http://emmo.info/emmo/middle/metrology#EMMO_dd4a7f3e_ef56_466c_ac1a_d2716b5f87ec

Definition: "A property of a phenomenon, body, or substance, where the property has a magnitude that can be expressed by means of a number and a reference" ISO 80000-1

"A reference can be a measurement unit, a measurement procedure, a reference material, or a combination of such." International vocabulary of metrology (VIM)

Elucidation: A 'Quantity' that can be quantified with respect to a standardized reference physical instance (e.g. the prototype meter bar, the kg prototype) or method (e.g. resilience) through a measurement process.

Preflabel: QuantitativeProperty

Relations:

- is_a metrology.Quantity
- is_a properties.ObjectiveProperty
- equivalent_to properties.MeasuredQuantitativeProperty or properties.ModelledQuantitativeProperty or properties.ConventionalQuantitativeProperty

ConventionalQuantitativeProperty

IRI: http://emmo.info/emmo/middle/properties#EMMO_d8aa8e1f_b650_416d_88a0_5118de945456

Elucidation: A quantitative property attributed by agreement to a quantity for a given purpose.

Example: The thermal conductivity of a copper sample in my laboratory can be assumed to be the conductivity that appears in the vendor specification. This value has been obtained by measurement of a sample which is not the one I have in my laboratory. This conductivity value is then a conventional quantitiative property assigned to my sample through a semiotic process in which no actual measurement is done by my laboratory.

If I don't believe the vendor, then I can measure the actual thermal conductivity. I then perform a measurement process that semiotically assign another value for the conductivity, which is a measured property, since is part of a measurement process.

Then I have two different physical quantities that are properties thanks to two different semiotic processes.

Preflabel: ConventionalQuantitativeProperty

Relations:

- is_a metrology.QuantitativeProperty

OrdinalQuantity

IRI: http://emmo.info/emmo/middle/metrology#EMMO_c46f091c_0420_4c1a_af30_0a2c8ebcf7d7

Elucidation: "Quantity, defined by a conventional measurement procedure, for which a total ordering relation can be established, according to magnitude, with other quantities of the same kind, but for which no algebraic operations among those quantities exist" International vocabulary of metrology (VIM)

Example: Hardness Resilience

Preflabel: OrdinalQuantity

Relations:

- is_a metrology.Quantity

Quantity

IRI: http://emmo.info/emmo/middle/metrology#EMMO_f658c301_ce93_46cf_9639_4eace2c5d1d5

Elucidation: A symbolic that has parts a reference unit and a numerical object separated by a space expressing the value of a quantitative property (expressed as the product of the numerical and the unit).

Example: 6.8 m 0.9 km 8 K 6 MeV 43.5 HRC(150 kg)

Preflabel: Quantity

Relations:

- is_a metrology.Metrological
- is_a reductionistic.State
- metrology.hasReferenceUnit exactly 1 metrology.ReferenceUnit
- metrology.hasQuantityValue exactly 1 math.Numerical
- disjoint_union_of metrology.PhysicalQuantity, metrology.OrdinalQuantity

ModelledQuantitativeProperty

IRI: http://emmo.info/emmo/middle/properties#EMMO_d0200cf1_e4f4_45ae_873f_b9359daea3cd

Preflabel: ModelledQuantitativeProperty

Relations:

- is_a metrology.QuantitativeProperty

Base Quantity branch

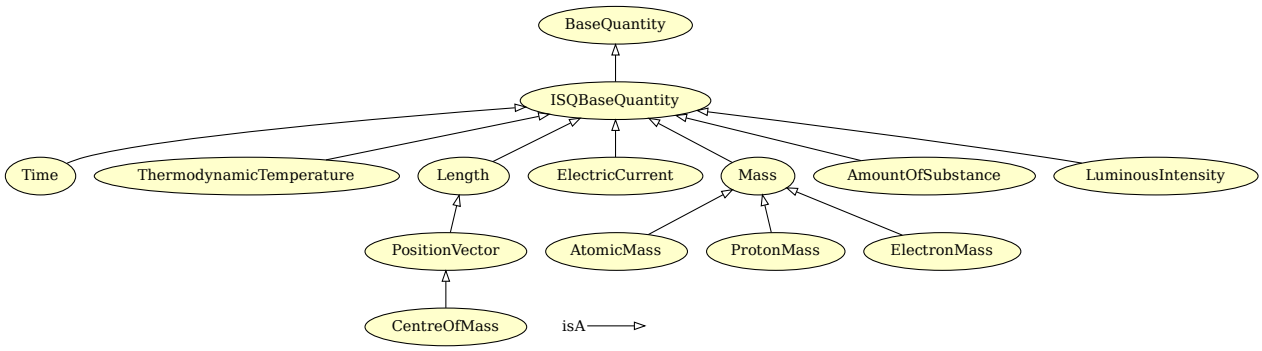


Figure 3.32: Base Quantity branch.

Time

IRI: http://emmo.info/emmo/middle/isq#EMMO_d4f7d378_5e3b_468a_baa1_a7e98358cda7

Definition: One-dimensional subspace of space-time, which is locally orthogonal to space.

Elucidation: The indefinite continued progress of existence and events that occur in apparently irreversible succession from the past through the present to the future.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-01-03

Dbpediaentry: http://dbpedia.org/page/Time

Iupacentry: https://doi.org/10.1351/goldbook.T06375

Physicaldimension: T+1 L0 M0 I0 Θ0 N0 J0

Preflabel: Time

Qudtentry: qudt.org/vocab/quantitykind/Time

Relations:

- is_a isq.ISQBaseQuantity

ThermodynamicTemperature

IRI: http://emmo.info/emmo/middle/isq#EMMO_affe07e4_e9bc_4852_86c6_69e26182a17f

Elucidation: Thermodynamic temperature is the absolute measure of temperature. It is defined by the third law of thermodynamics in which the theoretically lowest temperature is the null or zero point.

Dbpediaentry: http://dbpedia.org/page/Thermodynamic_temperature

Iupacentry: https://doi.org/10.1351/goldbook.T06321

Physicaldimension: T0 L0 M0 I0 Θ+1 N0 J0

Preflabel: ThermodynamicTemperature

Qudtentry: qudt.org/vocab/quantitykind/ThermodynamicTemperature

Relations:

- is_a isq.ISQBaseQuantity

Length

IRI: http://emmo.info/emmo/middle/isq#EMMO_cd2cd0de_e0cc_4ef1_b27e_2e88db027bac

Elucidation: Extend of a spatial dimension.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-01-19

Dbpediaentry: http://dbpedia.org/page/Length

Iupacentry: https://doi.org/10.1351/goldbook.L03498

Physicaldimension: T0 L+1 M0 I0 Θ0 N0 J0

Preflabel: Length

Relations:

- is_a isq.ISQBaseQuantity

AtomicMass

IRI: http://emmo.info/emmo/middle/isq#EMMO_27367073_ed8a_481a_9b07_f836dfe31f7f

Definition: The mass of an atom in the ground state.

Iupacentry: https://doi.org/10.1351/goldbook.A00496

Physicaldimension: T0 L0 M+1 I0 Θ0 N0 J0

Preflabel: AtomicMass

Wikipediaentry: https://en.wikipedia.org/wiki/Atomic_mass

Relations:

- is_a isq.Mass

ElectricCurrent

IRI: http://emmo.info/emmo/middle/isq#EMMO_c995ae70_3b84_4ebb_bcfc_69e6a281bb88

Elucidation: A flow of electric charge.

Dbpediaentry: http://dbpedia.org/page/Electric_current

Iupacentry: https://doi.org/10.1351/goldbook.E01927

Physicaldimension: T0 L0 M0 I+1 Θ0 N0 J0

Preflabel: ElectricCurrent

Qudtentry: http://qudt.org/vocab/quantitykind/ElectricCurrent

Relations:

- is_a isq.ISQBaseQuantity

PositionVector

IRI: http://emmo.info/emmo/middle/isq#EMMO_44da6d75_54a4_4aa8_bd3a_156f6e9abb8e

Definition: Vector r characterizing a point P in a point space with a given origin point O.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-03-12

Altlabel: Position

Physicaldimension: T0 L+1 M0 I0 Θ0 N0 J0

Preflabel: PositionVector

Relations:

- is_a isq.Length

ISQBaseQuantity

IRI: http://emmo.info/emmo/middle/isq#EMMO_1a4c1a97_88a7_4d8e_b2f9_2ca58e92dde4

Elucidation: Base quantities defined in the International System of Quantities (ISQ).

Preflabel: ISQBaseQuantity

Wikipediaentry: https://en.wikipedia.org/wiki/International_System_of_Quantities

Relations:

- is_a isq.InternationalSystemOfQuantity
- is_a metrology.BaseQuantity
- disjoint_union_of isq.LuminousIntensity, isq.AmountOfSubstance, isq.ThermodynamicTemperature, isq.ElectricCurrent, isq.Length, isq.Time, isq.Mass

CentreOfMass

IRI: http://emmo.info/emmo/middle/isq#EMMO_9d8f708a_f291_4d72_80ec_362c6e6bbca6

Elucidation: The unique point where the weighted relative position of the distributed mass of an Item sums to zero. Equivalently, it is the point where if a force is applied to the Item, causes the Item to move in direction of force without rotation.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-03-12

Dbpediaentry: http://dbpedia.org/page/Center_of_mass

Physicaldimension: T0 L+1 M0 I0 Θ0 N0 J0

Preflabel: CentreOfMass

Wikipediaentry: https://en.wikipedia.org/wiki/Center_of_mass

Relations:

- is_a isq.PositionVector

BaseQuantity

IRI: http://emmo.info/emmo/middle/metrology#EMMO_acaaa124_3dde_48b6_86e6_6ec6f364f408

Elucidation: “Quantity in a conventionally chosen subset of a given system of quantities, where no quantity in the subset can be expressed in terms of the other quantities within that subset” ISO 80000-1

Preflabel: BaseQuantity

Relations:

- is_a metrology.PhysicalQuantity
- metrology.hasReferenceUnit only metrology.BaseUnit

Mass

IRI: http://emmo.info/emmo/middle/isq#EMMO_ed4af7ae_63a2_497e_bb88_2309619ea405

Elucidation: Property of a physical body that express its resistance to acceleration (a change in its state of motion) when a force is applied.

Dbpediaentry: http://dbpedia.org/page/Mass

Iupacentry: https://doi.org/10.1351/goldbook.M03709

Physicaldimension: T0 L0 M+1 I0 Θ0 N0 J0

Preflabel: Mass

Qudtentry: http://qudt.org/vocab/quantitykind/Mass

Relations:

- is_a isq.ISQBaseQuantity
- Inverse(properties.hasProperty) only physicalistic.Matter

AmountOfSubstance

IRI: http://emmo.info/emmo/middle/isq#EMMO_8159c26a_494b_4fa0_9959_10888f152298

Elucidation: The number of elementary entities present.

Dbpediaentry: http://dbpedia.org/page/Amount_of_substance

Iupacentry: https://doi.org/10.1351/goldbook.A00297

Physicaldimension: T0 L0 M0 I0 Θ0 N+1 J0

Preflabel: AmountOfSubstance

Qudtentry: http://qudt.org/vocab/quantitykind/AmountOfSubstance

Relations:

- is_a isq.ISQBaseQuantity

LuminousIntensity

IRI: http://emmo.info/emmo/middle/isq#EMMO_50bf79a6_a48b_424d_9d2c_813bd631231a

Elucidation: A measure of the wavelength-weighted power emitted by a light source in a particular direction per unit solid angle. It is based on the luminosity function, which is a standardized model of the sensitivity of the human eye.

Dbpediaentry: http://dbpedia.org/page/Luminous_intensity

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J+1

Preflabel: LuminousIntensity

Qudtentry: http://qudt.org/vocab/quantitykind/Length

Relations:

- is_a isq.ISQBaseQuantity

ProtonMass

IRI: http://emmo.info/emmo/middle/isq#EMMO_8d689295_7d84_421b_bc01_d5cceb2c2086

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?mp

Iupacentry: https://doi.org/10.1351/goldbook.P04914

Physicaldimension: T0 L0 M+1 I0 Θ0 N0 J0

Preflabel: ProtonMass

Qudtentry: http://qudt.org/vocab/constant/ProtonMass

Relations:

- is_a isq.Mass
- is_a metrology.MeasuredConstant

ElectronMass

IRI: http://emmo.info/emmo/middle/isq#EMMO_44fc8c60_7a9c_49af_a046_e1878c88862c

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?me

Dbpediaentry: http://dbpedia.org/page/Electron_rest_mass

Iupacentry: https://doi.org/10.1351/goldbook.E02008

Physicaldimension: T0 L0 M+1 I0 Θ0 N0 J0

Preflabel: ElectronMass

Qudtentry: http://qudt.org/vocab/constant/ElectronMass

Relations:

- is_a isq.Mass
- is_a metrology.MeasuredConstant

Derived Quantity branch

Radioactivity

IRI: http://emmo.info/emmo/middle/isq#EMMO_8d3da9ac_2265_4382_bee5_db72046722f8

Elucidation: Decays per unit time.

Iupacentry: https://doi.org/10.1351/goldbook.A00114

Physicaldimension: T-1 L0 M0 I0 Θ0 N0 J0

Preflabel: Radioactivity

Qudtentry: http://qudt.org/vocab/quantitykind/SpecificActivity

Relations:

- is_a isq.ISQDerivedQuantity

DerivedQuantity

IRI: http://emmo.info/emmo/middle/metrology#EMMO_71f6ab56_342c_484b_bbe0_de86b7367cb3

Elucidation: “Quantity, in a system of quantities, defined in terms of the base quantities of that system”.

Preflabel: DerivedQuantity

Relations:

- is_a metrology.PhysicalQuantity

PureNumberQuantity

IRI: http://emmo.info/emmo/middle/isq#EMMO_ba882f34_0d71_4e4f_9d92_0c076c633a2c

Elucidation: A pure number, typically the number of something.

Example: 1, i, π, the number of protons in the nucleus of an atom

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: PureNumberQuantity

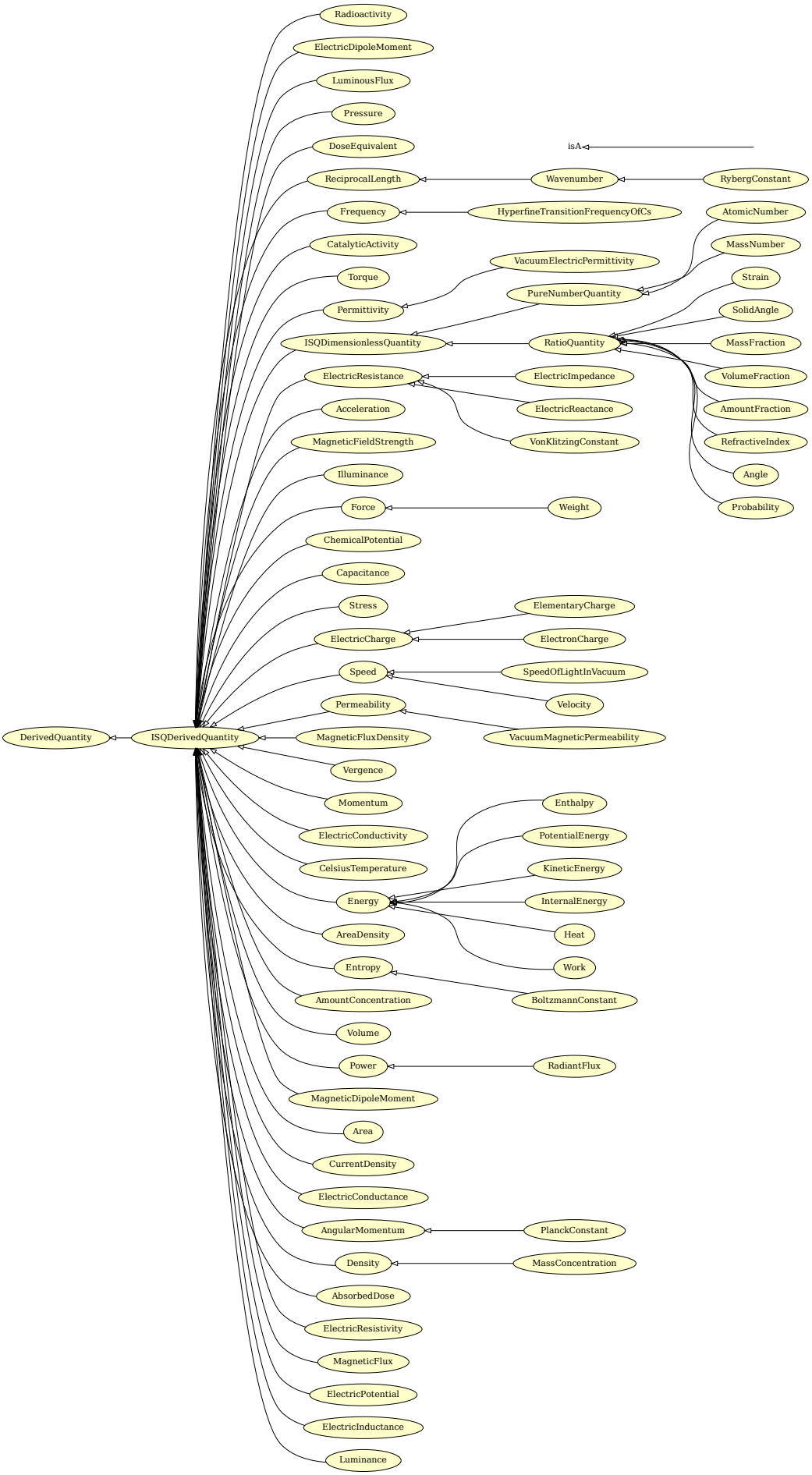


Figure 3.33: Derived Quantity branch.

Relations:

- is_a isq.ISQDimensionlessQuantity

ElectricDipoleMoment

IRI: http://emmo.info/emmo/middle/isq#EMMO_1a179ce4_3724_47f8_bee5_6292e3ac9942

Elucidation: An electric dipole, vector quantity of magnitude equal to the product of the positive charge and the distance between the charges and directed from the negative charge to the positive charge.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=121-11-35

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=121-11-36

Dbpediaentry: http://dbpedia.org/page/Electric_dipole_moment

Iupacentry: https://doi.org/10.1351/goldbook.E01929

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/ElectricDipoleMoment

Physicaldimension: T+1 L+1 M0 I+1 Θ0 N0 J0

Preflabel: ElectricDipoleMoment

Qudtentry: http://qudt.org/vocab/quantitykind/ElectricDipoleMoment

Relations:

- is_a isq.ISQDerivedQuantity

LuminousFlux

IRI: http://emmo.info/emmo/middle/isq#EMMO_e2ee1c98_497a_4f66_b4ed_5711496a848e

Elucidation: Perceived power of light.

Dbpediaentry: http://dbpedia.org/page/Luminous_flux

Iupacentry: https://doi.org/10.1351/goldbook.L03646

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J+1

Preflabel: LuminousFlux

Qudtentry: http://qudt.org/vocab/quantitykind/LuminousFlux

Relations:

- is_a isq.ISQDerivedQuantity

Pressure

IRI: http://emmo.info/emmo/middle/isq#EMMO_50a44256_9dc5_434b_bad4_74a4d9a29989

Elucidation: The force applied perpendicular to the surface of an object per unit area over which that force is distributed.

Dbpediaentry: http://dbpedia.org/page/Pressure

Iupacentry: https://doi.org/10.1351/goldbook.P04819

Physicaldimension: T-2 L-1 M+1 I0 Θ0 N0 J0

Preflabel: Pressure

Qudtentry: http://qudt.org/vocab/quantitykind/Pressure

Relations:

- is_a isq.ISQDerivedQuantity

DoseEquivalent

IRI: http://emmo.info/emmo/middle/isq#EMMO_3df10765_f6ff_4c9e_be3d_10b1809d78bd

Elucidation: A dose quantity used in the International Commission on Radiological Protection (ICRP) system of radiological protection.

Dbpediaentry: http://dbpedia.org/page/Energy

Iupacentry: https://doi.org/10.1351/goldbook.E02101

Physicaldimension: T-2 L+2 M0 I0 Θ0 N0 J0

Preflabel: DoseEquivalent

Qudtentry: http://qudt.org/vocab/quantitykind/DoseEquivalent

Relations:

- is_a isq.ISQDerivedQuantity

ElectricImpedance

IRI: http://emmo.info/emmo/middle/isq#EMMO_79a02de5_b884_4eab_bc18_f67997d597a2

Altlabel: Impedance

Dbpediaentry: http://dbpedia.org/page/Electrical_impedance

Physicaldimension: T-3 L+2 M+1 I-2 Θ0 N0 J0

Preflabel: ElectricImpedance

Qudtentry: http://qudt.org/vocab/quantitykind/Impedance

Relations:

- is_a isq.ElectricResistance

Strain

IRI: http://emmo.info/emmo/middle/isq#EMMO_acf636d4_9ac2_4ce3_960a_d54338e6cae3

Elucidation: Change of the relative positions of parts of a body, excluding a displacement of the body as a whole.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-03-57

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/Strain

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: Strain

Qudtentry: http://qudt.org/vocab/quantitykind/Strain

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only units-extension.LengthFractionUnit

ReciprocalLength

IRI: http://emmo.info/emmo/middle/isq#EMMO_ecec2983_7c26_4f8d_a981_51ca29668baf

Elucidation: The inverse of length.

Altlabel: InverseLength

Dbpediaentry: http://dbpedia.org/page/Reciprocal_length

Physicaldimension: T0 L-1 M0 I0 Θ0 N0 J0

Preflabel: ReciprocalLength

Qudtentry: http://qudt.org/vocab/quantitykind/InverseLength

Wikipediaentry: https://en.wikipedia.org/wiki/Reciprocal_length

Relations:

- is_a isq.ISQDerivedQuantity

Frequency

IRI: http://emmo.info/emmo/middle/isq#EMMO_852b4ab8_fc29_4749_a8c7_b92d4fca7d5a

Elucidation: Number of periods per time interval.

Dbpediaentry: http://dbpedia.org/page/Frequency

Iupacentry: https://doi.org/10.1351/goldbook.FT07383

Physicaldimension: T-1 L0 M0 I0 Θ0 N0 J0

Preflabel: Frequency

Qudtentry: http://qudt.org/vocab/quantitykind/Frequency

Relations:

- is_a isq.ISQDerivedQuantity

CatalyticActivity

IRI: http://emmo.info/emmo/middle/isq#EMMO_bd67d149_24c2_4bc9_833a_c2bc26f98fd3

Elucidation: Increase in the rate of reaction of a specified chemical reaction that an enzyme produces in a specific assay system.

Iupacentry: https://doi.org/10.1351/goldbook.C00881

Physicaldimension: T-1 L0 M0 I0 Θ0 N+1 J0

Preflabel: CatalyticActivity

Qudtentry: http://qudt.org/vocab/quantitykind/CatalyticActivity

Relations:

- is_a isq.ISQDerivedQuantity

Torque

IRI: http://emmo.info/emmo/middle/isq#EMMO_aaf9dd7f_0474_40d0_9606_02def8515249

Elucidation: The effectiveness of a force to produce rotation about an axis, measured by the product of the force and the perpendicular distance from the line of action of the force to the axis.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-03-26

Dbpediaentry: http://dbpedia.org/page/Torque

Iupacentry: https://doi.org/10.1351/goldbook.T06400

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/Torque

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: Torque

Qudtentry: http://qudt.org/vocab/quantitykind/Torque

Relations:

- is_a isq.ISQDerivedQuantity

Permittivity

IRI: http://emmo.info/emmo/middle/isq#EMMO_0ee5779e_d798_4ee5_9bfe_c392d5bea112

Dbpediaentry: http://dbpedia.org/page/Permittivity

Iupacentry: https://doi.org/10.1351/goldbook.P04507

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/Permittivity

Physicaldimension: T+4 L-3 M-1 I+2 Θ0 N0 J0

Preflabel: Permittivity

Qudtentry: http://qudt.org/vocab/quantitykind/Permittivity

Relations:

- is_a isq.ISQDerivedQuantity

SpeedOfLightInVacuum

IRI: http://emmo.info/emmo/middle/isq#EMMO_99296e55_53f7_4333_9e06_760ad175a1b9

Elucidation: The speed of light in vacuum. Defines the base unit metre in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?c

Dbpediaentry: http://dbpedia.org/page/Speed_of_light

Iupacentry: https://doi.org/10.1351/goldbook.S05854

Physicaldimension: T-1 L+1 M0 I0 Θ0 N0 J0

Preflabel: SpeedOfLightInVacuum

Qudtentry: http://qudt.org/vocab/constant/SpeedOfLight_Vacuum

Relations:

- is_a isq.Speed
- is_a isq.SIExactConstant

ISQDimensionlessQuantity

IRI: http://emmo.info/emmo/middle/isq#EMMO_a66427d1_9932_4363_9ec5_7d91f2bfda1e

Elucidation: A quantity to which no physical dimension is assigned and with a corresponding unit of measurement in the SI of the unit one.

Dbpediaentry: http://dbpedia.org/page/Dimensionless_quantity

Iupacentry: https://doi.org/10.1351/goldbook.D01742

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: ISQDimensionlessQuantity

Wikipediaentry: https://en.wikipedia.org/wiki/Dimensionless_quantity

Relations:

- is_a isq.ISQDerivedQuantity

ISQDerivedQuantity

IRI: http://emmo.info/emmo/middle/isq#EMMO_2946d40b_24a1_47fa_8176_e3f79bb45064

Elucidation: Derived quantities defined in the International System of Quantities (ISQ).

Preflabel: ISQDerivedQuantity

Relations:

- is_a isq.InternationalSystemOfQuantity
- is_a metrology.DerivedQuantity

PlanckConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_76cc4efc_231e_42b4_be83_2547681caed6

Elucidation: The quantum of action. It defines the kg base unit in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?h

Dbpediaentry: http://dbpedia.org/page/Planck_constant

Iupacentry: https://doi.org/10.1351/goldbook.P04685

Physicaldimension: T-1 L+2 M+1 I0 Θ0 N0 J0

Preflabel: PlanckConstant

Qudtentry: http://qudt.org/vocab/constant/PlanckConstant

Relations:

- is_a isq.AngularMomentum
- is_a isq.SIExactConstant

ElectricReactance

IRI: http://emmo.info/emmo/middle/isq#EMMO_92b2fb85_2143_4bc7_bbca_df3e6944bfc1

Altlabel: Reactance

Dbpediaentry: http://dbpedia.org/page/Electrical_reactance

Physicaldimension: T-3 L+2 M+1 I-2 Θ0 N0 J0

Preflabel: ElectricReactance

Qudtentry: http://qudt.org/vocab/quantitykind/Reactance

Relations:

- is_a isq.ElectricResistance

AtomicNumber

IRI: http://emmo.info/emmo/middle/isq#EMMO_07de47e0_6bb6_45b9_b55a_4f238efbb105

Definition: Number of protons in an atomic nucleus.

Dbpediaentry: http://dbpedia.org/page/Atomic_number

Iupacentry: https://doi.org/10.1351/goldbook.A00499

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: AtomicNumber

Qudtentry: http://qudt.org/vocab/quantitykind/AtomicNumber

Relations:

- is_a isq.PureNumberQuantity

BoltzmannConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_ffc7735f_c177_46a4_98e9_a54440d29209

Elucidation: A physical constant relating energy at the individual particle level with temperature. It is the gas constant R divided by the Avogadro constant.

It defines the Kelvin unit in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?k

Dbpediaentry: http://dbpedia.org/page/Boltzmann_constant

Iupacentry: https://doi.org/10.1351/goldbook.B00695

Physicaldimension: T-2 L+2 M+1 I0 Θ-1 N0 J0

Preflabel: BoltzmannConstant

Qudtentry: http://qudt.org/vocab/constant/BoltzmannConstant

Relations:

- is_a isq.Entropy
- is_a isq.SIExactConstant

ElectricResistance

IRI: http://emmo.info/emmo/middle/isq#EMMO_e88f75d6_9a17_4cfc_bdf7_43d7cea5a9a1

Elucidation: Measure of the difficulty to pass an electric current through a material.

Altlabel: Resistance

Dbpediaentry: http://dbpedia.org/page/Electrical_resistance_and_conductance

Iupacentry: https://doi.org/10.1351/goldbook.E01936

Physicaldimension: T-3 L+2 M+1 I-2 Θ0 N0 J0

Preflabel: ElectricResistance

Qudtentry: http://qudt.org/vocab/quantitykind/Resistance

Relations:

- is_a isq.ISQDerivedQuantity

SolidAngle

IRI: http://emmo.info/emmo/middle/isq#EMMO_e7c9f7fd_e534_4441_88fe_1fec6cb20f26

Elucidation: Ratio of area on a sphere to its radius squared.

Dbpediaentry: http://dbpedia.org/page/Solid_angle

Iupacentry: https://doi.org/10.1351/goldbook.S05732

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: SolidAngle

Qudtentry: http://qudt.org/vocab/quantitykind/SolidAngle

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only units-extension.AreaFractionUnit

Enthalpy

IRI: http://emmo.info/emmo/middle/isq#EMMO_4091d5ec_a4df_42b9_a073_9a090839279f

Dbpediaentry: http://dbpedia.org/page/Enthalpy

Iupacentry: https://doi.org/10.1351/goldbook.E02141

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: Enthalpy

Qudtentry: http://qudt.org/vocab/quantitykind/Enthalpy

Relations:

- is_a isq.Energy

Acceleration

IRI: http://emmo.info/emmo/middle/isq#EMMO_e37ac288_aa60_415a_8cb7_c375724ac8e1

Dbpediaentry: http://dbpedia.org/page/Acceleration

Iupacentry: https://doi.org/10.1351/goldbook.A00051

Physicaldimension: T-2 L+1 M0 I0 Θ0 N0 J0

Preflabel: Acceleration

Qudtentry: http://qudt.org/vocab/quantitykind/Acceleration

Relations:

- is_a isq.ISQDerivedQuantity

MassFraction

IRI: http://emmo.info/emmo/middle/isq#EMMO_7c055d65_2929_40e1_af4f_4bf10995ad50

Dbpediaentry: http://dbpedia.org/page/Mass_fraction_(chemistry)

Iupacentry: https://doi.org/10.1351/goldbook.M03722

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/MassFraction

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: MassFraction

Qudtentry: http://qudt.org/vocab/quantitykind/MassFraction

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only units-extension.MassFractionUnit

MagneticFieldStrength

IRI: http://emmo.info/emmo/middle/isq#EMMO_b4895f75_41c8_4fd9_b6d6_4d5f7c99c423

Dbpediaentry: http://dbpedia.org/page/Magnetic_field

Iupacentry: https://doi.org/10.1351/goldbook.M03683

Physicaldimension: T0 L-1 M0 I+1 Θ0 N0 J0

Preflabel: MagneticFieldStrength

Qudtentry: http://qudt.org/vocab/quantitykind/MagneticFieldStrength

Relations:

- is_a isq.ISQDerivedQuantity

RatioQuantity

IRI: http://emmo.info/emmo/middle/isq#EMMO_faab3f84_e475_4a46_af9c_7d249f0b9aef

Elucidation: The class of quantities that are the ratio of two quantities with the same physical dimensionality.

Example: refractive index, volume fraction, fine structure constant

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: RatioQuantity

Relations:

- is_a isq.ISQDimensionlessQuantity

Illuminance

IRI: http://emmo.info/emmo/middle/isq#EMMO_b51fbd00_a857_4132_9711_0ef70e7bdd20

Definition: The total luminous flux incident on a surface, per unit area.

Dbpediaentry: http://dbpedia.org/page/Illuminance

Iupacentry: https://doi.org/10.1351/goldbook.I02941

Physicaldimension: T0 L-2 M0 I0 Θ0 N0 J+1

Preflabel: Illuminance

Qudtentry: http://qudt.org/vocab/quantitykind/Illuminance

Relations:

- is_a isq.ISQDerivedQuantity

Force

IRI: http://emmo.info/emmo/middle/isq#EMMO_1f087811_06cb_42d5_90fb_25d0e7e068ef

Elucidation: Any interaction that, when unopposed, will change the motion of an object.

Dbpediaentry: http://dbpedia.org/page/Force

Iupacentry: https://doi.org/10.1351/goldbook.F02480

Physicaldimension: T-2 L+1 M+1 I0 Θ0 N0 J0

Preflabel: Force

Qudtentry: http://qudt.org/vocab/quantitykind/Force

Relations:

- is_a isq.ISQDerivedQuantity

ChemicalPotential

IRI: http://emmo.info/emmo/middle/isq#EMMO_88fc5d1b_d3ab_4626_b24c_915ebe7400ca

Dbpediaentry: http://dbpedia.org/page/Chemical_potential

Iupacentry: https://doi.org/10.1351/goldbook.C01032

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N-1 J0

Preflabel: ChemicalPotential

Qudtentry: http://qudt.org/vocab/quantitykind/ChemicalPotential

Relations:

- is_a isq.ISQDerivedQuantity

Wavenumber

IRI: http://emmo.info/emmo/middle/isq#EMMO_d859588d_44dc_4614_bc75_5fcd0058acc8

Dbpediaentry: http://dbpedia.org/page/Wavenumber

Iupacentry: https://doi.org/10.1351/goldbook.W06664

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/Wavenumber

Physicaldimension: T0 L-1 M0 I0 Θ0 N0 J0

Preflabel: Wavenumber

Qudtentry: http://qudt.org/vocab/quantitykind/Wavenumber

Relations:

- is_a isq.ReciprocalLength

MassNumber

IRI: http://emmo.info/emmo/middle/isq#EMMO_dc6c8de0_cfc4_4c66_a7dc_8f720e732d54

Definition: Number of nucleons in an atomic nucleus.

Altlabel: AtomicMassNumber

Altlabel: NucleonNumber

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: MassNumber

Qudtentry: http://qudt.org/vocab/quantitykind/MassNumber

Relations:

- is_a isq.PureNumberQuantity

RadiantFlux

IRI: http://emmo.info/emmo/middle/isq#EMMO_e46f3f24_c2ec_4552_8dd4_cfc5c0a89c09

Dbpediaentry: http://dbpedia.org/page/Radiant_flux

Iupacentry: https://doi.org/10.1351/goldbook.R05046

Physicaldimension: T-3 L+2 M+1 I0 Θ0 N0 J0

Preflabel: RadiantFlux

Qudtentry: http://qudt.org/vocab/quantitykind/RadiantFlux

Relations:

- is_a isq.Power

ElementaryCharge

IRI: http://emmo.info/emmo/middle/isq#EMMO_58a650f0_a638_4743_8439_535a325e5c4c

Elucidation: The magnitude of the electric charge carried by a single electron. It defines the base unit Ampere in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?e

Dbpediaentry: http://dbpedia.org/page/Elementary_charge

Iupacentry: https://doi.org/10.1351/goldbook.E02032

Physicaldimension: T+1 L0 M0 I+1 Θ0 N0 J0

Preflabel: ElementaryCharge

Qudtentry: http://qudt.org/vocab/quantitykind/ElementaryCharge

Relations:

- is_a isq.ElectricCharge
- is_a isq.SIExactConstant

Capacitance

IRI: http://emmo.info/emmo/middle/isq#EMMO_99dba333_0dbd_4f75_8841_8c0f97fd58e2

Elucidation: The derivative of the electric charge of a system with respect to the electric potential.

Altlabel: ElectricCapacitance

Dbpediaentry: http://dbpedia.org/page/Capacitance

Iupacentry: https://doi.org/10.1351/goldbook.C00791

Physicaldimension: T+4 L-2 M-1 I+2 Θ0 N0 J0

Preflabel: Capacitance

Qudtentry: http://qudt.org/vocab/quantitykind/Capacitance

Relations:

- is_a isq.ISQDerivedQuantity

Stress

IRI: http://emmo.info/emmo/middle/isq#EMMO_d1917609_db5e_4b8a_9b76_ef1d6f860a81

Dbpediaentry: http://dbpedia.org/page/Stress_(mechanics)

Physicaldimension: T-2 L-1 M+1 I0 Θ0 N0 J0

Preflabel: Stress

Qudtentry: http://qudt.org/vocab/quantitykind/Stress

Relations:

- is_a isq.ISQDerivedQuantity

PotentialEnergy

IRI: http://emmo.info/emmo/middle/isq#EMMO_4c151909_6f26_4ef9_b43d_7c9e9514883a

Elucidation: The energy possessed by a body by virtue of its position or orientation in a potential field.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-03-48

Dbpediaentry: http://dbpedia.org/page/Potential_energy

Iupacentry: https://doi.org/10.1351/goldbook.P04778

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/PotentialEnergy

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: PotentialEnergy

Qudtentry: http://qudt.org/vocab/quantitykind/PotentialEnergy

Relations:

- is_a isq.Energy

ElectricCharge

IRI: http://emmo.info/emmo/middle/isq#EMMO_1604f495_328a_4f28_9962_f4cc210739dd

Elucidation: The physical property of matter that causes it to experience a force when placed in an electromagnetic field.

Altlabel: Charge

Dbpediaentry: http://dbpedia.org/page/Electric_charge

Iupacentry: https://doi.org/10.1351/goldbook.E01923

Physicaldimension: T+1 L0 M0 I+1 Θ0 N0 J0

Preflabel: ElectricCharge

Qudtentry: http://qudt.org/vocab/quantitykind/ElectricCharge

Relations:

- is_a isq.ISQDerivedQuantity

Speed

IRI: http://emmo.info/emmo/middle/isq#EMMO_81369540_1b0e_471b_9bae_6801af22800e

Dbpediaentry: http://dbpedia.org/page/Speed

Iupacentry: https://doi.org/10.1351/goldbook.S05852

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/Speed

Physicaldimension: T-1 L+1 M0 I0 Θ0 N0 J0

Preflabel: Speed

Qudtentry: http://qudt.org/vocab/quantitykind/Speed

Relations:

- is_a isq.ISQDerivedQuantity

VolumeFraction

IRI: http://emmo.info/emmo/middle/isq#EMMO_a8eb87b5_4d10_4137_a75c_e04ee59ca095

Elucidation: Volume of a constituent of a mixture divided by the sum of volumes of all constituents prior to mixing.

Dbpediaentry: http://dbpedia.org/page/Volume_fraction

Iupacentry: https://doi.org/10.1351/goldbook.V06643

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/VolumeFraction

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: VolumeFraction

Qudtentry: http://qudt.org/vocab/quantitykind/VolumeFraction

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only units-extension.VolumeFractionUnit

Permeability

IRI: http://emmo.info/emmo/middle/isq#EMMO_09663630_1b84_4202_91e6_e641104f579e

Altlabel: ElectromagneticPermeability

Dbpediaentry: http://dbpedia.org/page/Permeability_(electromagnetism)

Iupacentry: https://doi.org/10.1351/goldbook.P04503

Physicaldimension: T-2 L+1 M+1 I-2 Θ0 N0 J0

Preflabel: Permeability

Qudtentry: http://qudt.org/vocab/quantitykind/ElectromagneticPermeability

Relations:

- is_a isq.ISQDerivedQuantity

MagneticFluxDensity

IRI: http://emmo.info/emmo/middle/isq#EMMO_961d1aba_f75e_4411_aaa4_457f7516ed6b

Elucidation: Strength of the magnetic field.

Dbpediaentry: http://dbpedia.org/page/Magnetic_field

Iupacentry: https://doi.org/10.1351/goldbook.M03686

Physicaldimension: T-2 L0 M+1 I-1 Θ0 N0 J0

Preflabel: MagneticFluxDensity

Qudtentry: http://qudt.org/vocab/quantitykind/MagneticFluxDensity

Relations:

- is_a isq.ISQDerivedQuantity

Vergence

IRI: http://emmo.info/emmo/middle/isq#EMMO_1e7603a7_1365_49b8_b5e5_3711c8e6b904

Dbpediaentry: http://dbpedia.org/page/Vergence

Physicaldimension: T0 L-1 M0 I0 Θ0 N0 J0

Preflabel: Vergence

Relations:

- is_a isq.ISQDerivedQuantity

Momentum

IRI: http://emmo.info/emmo/middle/isq#EMMO_43776fc9_d712_4571_85f0_72183678039a

Dbpediaentry: http://dbpedia.org/page/Momentum

Iupacentry: https://doi.org/10.1351/goldbook.M04007

Physicaldimension: T-1 L+1 M+1 I0 Θ0 N0 J0

Preflabel: Momentum

Qudtentry: http://qudt.org/vocab/quantitykind/Momentum

Relations:

- is_a isq.ISQDerivedQuantity

ElectricConductivity

IRI: http://emmo.info/emmo/middle/isq#EMMO_cde4368c_1d4d_4c94_8548_604749523c6d

Altlabel: Conductivity

Dbpediaentry: http://dbpedia.org/page/Electrical_resistivity_and_conductivity

Iupacentry: https://doi.org/10.1351/goldbook.C01245

Physicaldimension: T+3 L-3 M-1 I+2 Θ0 N0 J0

Preflabel: ElectricConductivity

Qudtentry: http://qudt.org/vocab/quantitykind/ElectricConductivity

Relations:

- is_a isq.ISQDerivedQuantity

AmountFraction

IRI: http://emmo.info/emmo/middle/isq#EMMO_04b3300c_98bd_42dc_a3b5_e6c29d69f1ac

Definition: The amount of a constituent divided by the total amount of all constituents in a mixture.

Altlabel: MoleFraction

Dbpediaentry: http://dbpedia.org/page/Mole_fraction

Iupacentry: https://doi.org/10.1351/goldbook.A00296

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/AmountOfSubstanceFraction

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: AmountFraction

Qudtentry: http://qudt.org/vocab/quantitykind/MoleFraction

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only units-extension.AmountFractionUnit

HyperfineTransitionFrequencyOfCs

IRI: http://emmo.info/emmo/middle/isq#EMMO_f96feb3f_4438_4e43_aa44_7458c4d87fc2

Elucidation: The frequency standard in the SI system in which the photon absorption by transitions between the two hyperfine ground states of caesium-133 atoms are used to control the output frequency.

It defines the base unit second in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?nucs

Physicaldimension: T-1 L0 M0 I0 Θ0 N0 J0

Preflabel: HyperfineTransitionFrequencyOfCs

Relations:

- is_a isq.Frequency
- is_a isq.SIExactConstant

Weight

IRI: http://emmo.info/emmo/middle/isq#EMMO_04cf0295_3e8f_4693_a87f_3130d125cf05

Dbpediaentry: http://dbpedia.org/page/Weight

Iupacentry: https://doi.org/10.1351/goldbook.W06668

Physicaldimension: T-2 L+1 M+1 I0 Θ0 N0 J0

Preflabel: Weight

Qudtentry: http://qudt.org/vocab/quantitykind/Weight

Relations:

- is_a isq.Force

ElectronCharge

IRI: http://emmo.info/emmo/middle/isq#EMMO_cc01751d_dd05_429b_9d0c_1b7a74d1f277

Definition: The charge of an electron.

Iupacentry: https://doi.org/10.1351/goldbook.E01982

Physicaldimension: T+1 L0 M0 I+1 Θ0 N0 J0

Preflabel: ElectronCharge

Relations:

- is_a isq.ElectricCharge
- is_a isq.SIExactConstant

CelsiusTemperature

IRI: http://emmo.info/emmo/middle/isq#EMMO_66bc9029_f473_45ff_bab9_c3509ff37a22

Elucidation: An objective comparative measure of hot or cold.

Temperature is a relative quantity that can be used to express temperature differences. Unlike ThermodynamicTemperature, it cannot express absolute temperatures.

Dbpediaentry: http://dbpedia.org/page/Temperature

Iupacentry: https://doi.org/10.1351/goldbook.T06261

Physicaldimension: T-1 L0 M0 I0 Θ0 N+1 J0

Preflabel: CelsiusTemperature

Relations:

- is_a isq.ISQDerivedQuantity

VacuumMagneticPermeability

IRI: http://emmo.info/emmo/middle/isq#EMMO_de021e4f_918f_47ef_a67b_11120f56b9d7

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?mu0

Physicaldimension: T-2 L+1 M+1 I-2 Θ0 N0 J0

Preflabel: VacuumMagneticPermeability

Qudtentry: http://qudt.org/vocab/constant/ElectromagneticPermeabilityOfVacuum

Relations:

- is_a isq.Permeability
- is_a metrology.MeasuredConstant

VacuumElectricPermittivity

IRI: http://emmo.info/emmo/middle/isq#EMMO_61a32ae9_8200_473a_bd55_59a9899996f4

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?ep0

Iupacentry: https://doi.org/10.1351/goldbook.P04508

Physicaldimension: T+4 L-3 M-1 I+2 Θ0 N0 J0

Preflabel: VacuumElectricPermittivity

Qudtentry: http://qudt.org/vocab/constant/PermittivityOfVacuum

Relations:

- is_a isq.Permittivity
- is_a metrology.MeasuredConstant

Energy

IRI: http://emmo.info/emmo/middle/isq#EMMO_31ec09ba_1713_42cb_83c7_b38bf6f9ced2

Elucidation: A property of objects which can be transferred to other objects or converted into different forms.

Dbpediaentry: http://dbpedia.org/page/Energy

Iupacentry: https://doi.org/10.1351/goldbook.E02101

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: Energy

Qudtentry: http://qudt.org/vocab/quantitykind/Energy

Relations:

- is_a isq.ISQDerivedQuantity

RybergConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_a3c78d6f_ae49_47c8_a634_9b6d86b79382

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?ryd

Dbpediaentry: http://dbpedia.org/page/Rydberg_constant

Iupacentry: https://doi.org/10.1351/goldbook.R05430

Physicaldimension: T0 L-1 M0 I0 Θ0 N0 J0

Preflabel: RybergConstant

Qudtentry: http://qudt.org/vocab/constant/RydbergConstant

Relations:

- is_a isq.Wavenumber
- is_a metrology.MeasuredConstant

KineticEnergy

IRI: http://emmo.info/emmo/middle/isq#EMMO_ac540a9d_0131_43f6_a33b_17e5cfc432ed

Elucidation: The energy of an object due to its motion.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-03-49

Dbpediaentry: http://dbpedia.org/page/Kinetic_energy

Iupacentry: https://doi.org/10.1351/goldbook.K03402

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/KineticEnergy

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: KineticEnergy

Qudtentry: http://qudt.org/vocab/quantitykind/KineticEnergy

Relations:

- is_a isq.Energy

AreaDensity

IRI: http://emmo.info/emmo/middle/isq#EMMO_afea89af_ef16_4bdb_99d5_f3b2f4c85a6c

Dbpediaentry: http://dbpedia.org/page/Area_density

Iupacentry: https://doi.org/10.1351/goldbook.S06167

Physicaldimension: T0 L-2 M+1 I0 Θ0 N0 J0

Preflabel: AreaDensity

Relations:

- is_a isq.ISQDerivedQuantity

Entropy

IRI: http://emmo.info/emmo/middle/isq#EMMO_9bbab0be_f9cc_4f46_9f46_0fd271911b79

Dbpediaentry: http://dbpedia.org/page/Entropy

Iupacentry: https://doi.org/10.1351/goldbook.E02149

Physicaldimension: T-2 L+2 M+1 I0 Θ-1 N0 J0

Preflabel: Entropy

Qudtentry: http://qudt.org/vocab/quantitykind/Entropy

Relations:

- is_a isq.ISQDerivedQuantity

InternalEnergy

IRI: http://emmo.info/emmo/middle/isq#EMMO_830b59f7_d047_438c_90cd_62845749efcb

Elucidation: A state quantity equal to the difference between the total energy of a system and the sum of the macroscopic kinetic and potential energies of the system.

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-04-20

Altlabel: ThermodynamicEnergy

Dbpediaentry: http://dbpedia.org/page/Internal_energy

Iupacentry: https://doi.org/10.1351/goldbook.I03103

Ommatch: http://www.ontology-of-units-of-measure.org/resource/om-2/InternalEnergy

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: InternalEnergy

Qudtentry: http://qudt.org/vocab/quantitykind/InternalEnergy

Relations:

- is_a isq.Energy

AmountConcentration

IRI: http://emmo.info/emmo/middle/isq#EMMO_d5be1faf_0c56_4f5a_9b78_581e6dee949f

Altlabel: Concentration

Altlabel: MolarConcentration

Altlabel: Molarity

Dbpediaentry: http://dbpedia.org/page/Molar_concentration

Iupacentry: https://doi.org/10.1351/goldbook.A00295

Physicaldimension: T0 L-3 M0 I0 Θ0 N+1 J0

Preflabel: AmountConcentration

Qudtentry: http://qudt.org/vocab/quantitykind/AmountOfSubstanceConcentrationOfB

Relations:

- is_a isq.ISQDerivedQuantity

Volume

IRI: http://emmo.info/emmo/middle/isq#EMMO_f1a51559_aa3d_43a0_9327_918039f0dfed

Dbpediaentry: http://dbpedia.org/page/Volume

Physicaldimension: T0 L-3 M0 I0 Θ0 N0 J0

Preflabel: Volume

Qudtentry: http://qudt.org/vocab/quantitykind/Volume

Relations:

- is_a isq.ISQDerivedQuantity

MassConcentration

IRI: http://emmo.info/emmo/middle/isq#EMMO_16f2fe60_2db7_43ca_8fee_5b3e416bfe87

Dbpediaentry: http://dbpedia.org/page/Mass_concentration_(chemistry)

Iupacentry: https://doi.org/10.1351/goldbook.M03713

Physicaldimension: T0 L-3 M+1 I0 Θ0 N0 J0

Preflabel: MassConcentration

Qudtentry: http://qudt.org/vocab/quantitykind/MassConcentration

Relations:

- is_a isq.Density

Velocity

IRI: http://emmo.info/emmo/middle/isq#EMMO_0329f1f5_8339_4ce4_8505_a264c6d606ba

Definition: Vector quantity giving the rate of change of a position vector.

– ISO 80000-3

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=113-01-32

Iso80000ref: 3-10.1

Physicaldimension: T-1 L+1 M0 I0 Θ0 N0 J0

Preflabel: Velocity

Qudtentry: http://qudt.org/vocab/quantitykind/Velocity

Relations:

- is_a isq.Speed

Power

IRI: http://emmo.info/emmo/middle/isq#EMMO_09b9021b_f97b_43eb_b83d_0a764b472bc2

Elucidation: Rate of transfer of energy per unit time.

Dbpediaentry: http://dbpedia.org/page/Power_(physics)

Iupacentry: https://doi.org/10.1351/goldbook.P04792

Physicaldimension: T-3 L+2 M+1 I0 Θ0 N0 J0

Preflabel: Power

Qudtentry: http://qudt.org/vocab/quantitykind/Power

Relations:

- is_a isq.ISQDerivedQuantity

MagneticDipoleMoment

IRI: http://emmo.info/emmo/middle/isq#EMMO_81e767f1_59b1_4d7a_bf69_17f322241831

Elucidation: Vector quantity μ causing a change to its energy ΔW in an external magnetic field of field flux density B:

`$\Updelta$W = -$\upmu$ · B`

Iecentry: http://www.electropedia.org/iev/iev.nsf/display?openform&ievref=121-11-55

Iso80000ref: 10-9.1

Dbpediaentry: http://dbpedia.org/page/Magnetic_moment

Iupacentry: http://goldbook.iupac.org/terms/view/M03688

Physicaldimension: T0 L+2 M0 I+1 Θ0 N0 J0

Preflabel: MagneticDipoleMoment

Qudtentry: http://qudt.org/vocab/quantitykind/MagneticDipoleMoment

Relations:

- is_a isq.ISQDerivedQuantity

Area

IRI: http://emmo.info/emmo/middle/isq#EMMO_96f39f77_44dc_491b_8fa7_30d887fe0890

Dbpediaentry: http://dbpedia.org/page/Area

Iupacentry: https://doi.org/10.1351/goldbook.A00429

Physicaldimension: T0 L+2 M0 I0 Θ0 N0 J0

Preflabel: Area

Qudtentry: http://qudt.org/vocab/quantitykind/Area

Relations:

- is_a isq.ISQDerivedQuantity

VonKlitzingConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_eb561764_276e_413d_a8cb_3a3154fd9bf8

Definition: The von Klitzing constant is defined as Planck constant divided by the square of the elementary charge.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?rk

Physicaldimension: T-3 L+2 M+1 I-2 Θ0 N0 J0

Preflabel: VonKlitzingConstant

Qudtentry: http://qudt.org/vocab/constant/VonKlitzingConstant

Relations:

- is_a isq.ElectricResistance
- is_a isq.SIExactConstant

CurrentDensity

IRI: http://emmo.info/emmo/middle/isq#EMMO_7c8007b0_58a7_4486_bf1c_4772852caca0

Dbpediaentry: http://dbpedia.org/page/Current_density

Iupacentry: https://doi.org/10.1351/goldbook.E01928

Physicaldimension: T0 L-2 M0 I+1 Θ0 N0 J0

Preflabel: CurrentDensity

Qudtentry: http://qudt.org/vocab/quantitykind/ElectricCurrentDensity

Relations:

- is_a isq.ISQDerivedQuantity

ElectricConductance

IRI: http://emmo.info/emmo/middle/isq#EMMO_ffb73b1e_5786_43e4_a964_cb32ac7affb7

Elucidation: Measure of the ease for electric current to pass through a material.

Altlabel: Conductance

Dbpediaentry: http://dbpedia.org/page/Electrical_resistance_and_conductance

Iupacentry: https://doi.org/10.1351/goldbook.E01925

Physicaldimension: T+3 L-2 M-1 I+2 Θ0 N0 J0

Preflabel: ElectricConductance

Qudtentry: http://qudt.org/vocab/quantitykind/Conductance

Relations:

- is_a isq.ISQDerivedQuantity

AngularMomentum

IRI: http://emmo.info/emmo/middle/isq#EMMO_66d01570_36dd_42fd_844d_29b81b029cd5

Dbpediaentry: http://dbpedia.org/page/Angular_momentum

Iupacentry: https://doi.org/10.1351/goldbook.A00353

Physicaldimension: T-1 L+2 M+1 I0 Θ0 N0 J0

Preflabel: AngularMomentum

Qudtentry: http://qudt.org/vocab/quantitykind/AngularMomentum

Relations:

- is_a isq.ISQDerivedQuantity

Density

IRI: http://emmo.info/emmo/middle/isq#EMMO_06448f64_8db6_4304_8b2c_e785dba82044

Dbpediaentry: http://dbpedia.org/page/Density

Iupacentry: https://doi.org/10.1351/goldbook.D01590

Physicaldimension: T0 L-3 M+1 I0 Θ0 N0 J0

Preflabel: Density

Qudtentry: http://qudt.org/vocab/quantitykind/Density

Relations:

- is_a isq.ISQDerivedQuantity

AbsorbedDose

IRI: http://emmo.info/emmo/middle/isq#EMMO_8e5dd473_808b_4a8a_b7cd_63068c12ff57

Definition: Energy imparted to matter by ionizing radiation in a suitable small element of volume divided by the mass of that element of volume.

Dbpediaentry: http://dbpedia.org/page/Absorbed_dose

Iupacentry: https://doi.org/10.1351/goldbook.A00031

Physicaldimension: T-2 L+2 M0 I0 Θ0 N0 J0

Preflabel: AbsorbedDose

Qudtentry: http://qudt.org/vocab/quantitykind/AbsorbedDose

Relations:

- is_a isq.ISQDerivedQuantity

Heat

IRI: http://emmo.info/emmo/middle/isq#EMMO_12d4ba9b_2f89_4ea3_b206_cd376f96c875

Iupacentry: https://doi.org/10.1351/goldbook.H02752

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: Heat

Qudtentry: http://qudt.org/vocab/quantitykind/Heat

Relations:

- is_a isq.Energy

Work

IRI: http://emmo.info/emmo/middle/isq#EMMO_624d72ee_e676_4470_9434_c22b4190d3d5

Definition: Product of force and displacement.

Dbpediaentry: http://dbpedia.org/page/Heat

Dbpediaentry: http://dbpedia.org/page/Work_(physics)

Iupacentry: https://doi.org/10.1351/goldbook.W06684

Physicaldimension: T-2 L+2 M+1 I0 Θ0 N0 J0

Preflabel: Work

Qudtentry: http://qudt.org/vocab/quantitykind/Work

Relations:

- is_a isq.Energy

ElectricResistivity

IRI: http://emmo.info/emmo/middle/isq#EMMO_e150fa8d_06dc_4bb8_bf95_04e2aea529c1

Altlabel: Resistivity

Dbpediaentry: http://dbpedia.org/page/Electrical_resistivity_and_conductivity

Iupacentry: https://doi.org/10.1351/goldbook.R05316

Physicaldimension: T-3 L+3 M+1 I-2 Θ0 N0 J0

Preflabel: ElectricResistivity

Qudtentry: http://qudt.org/vocab/quantitykind/Resistivity

Relations:

- is_a isq.ISQDerivedQuantity

MagneticFlux

IRI: http://emmo.info/emmo/middle/isq#EMMO_3b931698_937e_49be_ab1b_36fa52d91181

Elucidation: Measure of magnetism, taking account of the strength and the extent of a magnetic field.

Dbpediaentry: http://dbpedia.org/page/Magnetic_flux

Iupacentry: https://doi.org/10.1351/goldbook.M03684

Physicaldimension: T-2 L+2 M+1 I-1 Θ0 N0 J0

Preflabel: MagneticFlux

Qudtentry: http://qudt.org/vocab/quantitykind/MagneticFlux

Relations:

- is_a isq.ISQDerivedQuantity

RefractiveIndex

IRI: http://emmo.info/emmo/middle/isq#EMMO_5eedba4d_105b_44d8_b1bc_e33606276ea2

Dbpediaentry: http://dbpedia.org/page/Refractive_index

Iupacentry: https://doi.org/10.1351/goldbook.R05240

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: RefractiveIndex

Qudtentry: http://qudt.org/vocab/quantitykind/RefractiveIndex

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only units-extension.SpeedFractionUnit

Angle

IRI: http://emmo.info/emmo/middle/isq#EMMO_f3dd74c0_f480_49e8_9764_33b78638c235

Definition: Ratio of circular arc length to radius.

Altlabel: PlaneAngle

Dbpediaentry: http://dbpedia.org/page/Angle

Iupacentry: https://doi.org/10.1351/goldbook.A00346

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: Angle

Qudtentry: http://qudt.org/vocab/quantitykind/PlaneAngle

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only units-extension.LengthFractionUnit

ElectricPotential

IRI: http://emmo.info/emmo/middle/isq#EMMO_4f2d3939_91b1_4001_b8ab_7d19074bf845

Elucidation: Energy required to move a unit charge through an electric field from a reference point.

Altlabel: Voltage

Dbpediaentry: http://dbpedia.org/page/Voltage

Iupacentry: https://doi.org/10.1351/goldbook.A00424

Physicaldimension: T-3 L+2 M+1 I-1 Θ0 N0 J0

Preflabel: ElectricPotential

Qudtentry: http://qudt.org/vocab/quantitykind/Voltage

Relations:

- is_a isq.ISQDerivedQuantity

ElectricInductance

IRI: http://emmo.info/emmo/middle/isq#EMMO_04cc9451_5306_45d0_8554_22cee4d6e785

Elucidation: A property of an electrical conductor by which a change in current through it induces an electromotive force in both the conductor itself and in any nearby conductors by mutual inductance.

Altlabel: Inductance

Dbpediaentry: http://dbpedia.org/page/Inductance

Iupacentry: https://doi.org/10.1351/goldbook.M04076

Physicaldimension: T-2 L+2 M+1 I-2 Θ0 N0 J0

Preflabel: ElectricInductance

Qudtentry: http://qudt.org/vocab/quantitykind/Inductance

Relations:

- is_a isq.ISQDerivedQuantity

Probability

IRI: http://emmo.info/emmo/middle/isq#EMMO_0a88be81_343d_4388_92c1_09228ff95ada

Elucidation: Probability is a dimensionless quantity that can attain values between 0 and 1; zero denotes the impossible event and 1 denotes a certain event.

Iupacentry: https://doi.org/10.1351/goldbook.P04855

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: Probability

Relations:

- is_a isq.RatioQuantity
- metrology.hasReferenceUnit only metrology.UnitOne

Luminance

IRI: http://emmo.info/emmo/middle/isq#EMMO_97589322_710c_4af4_9431_1e5027f2be42

Dbpediaentry: http://dbpedia.org/page/Luminance

Iupacentry: https://doi.org/10.1351/goldbook.L03640

Physicaldimension: T0 L-2 M0 I0 Θ0 N0 J+1

Preflabel: Luminance

Qudtentry: http://qudt.org/vocab/quantitykind/Luminance

Relations:

- is_a isq.ISQDerivedQuantity

Physical Constant branch

Figure 3.34: Physical Constant branch.

MeasuredConstant

IRI: http://emmo.info/emmo/middle/metrology#EMMO_3f15d200_c97b_42c8_8ac0_d81d150361e2

Elucidation: For a given unit system, measured constants are physical constants that are not used to define the unit system. Hence, these constants have to be measured and will therefore be associated with an uncertainty.

Preflabel: MeasuredConstant

Relations:

- is_a metrology.PhysicalConstant

VonKlitzingConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_eb561764_276e_413d_a8cb_3a3154fd9bf8

Definition: The von Klitzing constant is defined as Planck constant divided by the square of the elementary charge.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?rk

Physicaldimension: T-3 L+2 M+1 I-2 Θ0 N0 J0

Preflabel: VonKlitzingConstant

Qudtentry: http://qudt.org/vocab/constant/VonKlitzingConstant

Relations:

- is_a isq.ElectricResistance
- is_a isq.SIExactConstant

PlanckConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_76cc4efc_231e_42b4_be83_2547681caed6

Elucidation: The quantum of action. It defines the kg base unit in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?h

Dbpediaentry: http://dbpedia.org/page/Planck_constant

Iupacentry: https://doi.org/10.1351/goldbook.P04685

Physicaldimension: T-1 L+2 M+1 I0 Θ0 N0 J0

Preflabel: PlanckConstant

Qudtentry: http://qudt.org/vocab/constant/PlanckConstant

Relations:

- is_a isq.AngularMomentum
- is_a isq.SIExactConstant

BoltzmannConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_ffc7735f_c177_46a4_98e9_a54440d29209

Elucidation: A physical constant relating energy at the individual particle level with temperature. It is the gas constant R divided by the Avogadro constant.

It defines the Kelvin unit in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?k

Dbpediaentry: http://dbpedia.org/page/Boltzmann_constant

Iupacentry: https://doi.org/10.1351/goldbook.B00695

Physicaldimension: T-2 L+2 M+1 I0 Θ-1 N0 J0

Preflabel: BoltzmannConstant

Qudtentry: http://qudt.org/vocab/constant/BoltzmannConstant

Relations:

- is_a isq.Entropy
- is_a isq.SIExactConstant

NewtonianConstantOfGravity

IRI: http://emmo.info/emmo/middle/isq#EMMO_da831168_975a_41f8_baae_279c298569da

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?bg

Dbpediaentry: http://dbpedia.org/page/Gravitational_constant

Iupacentry: https://doi.org/10.1351/goldbook.G02695

Physicaldimension: T-2 L+3 M-1 I0 Θ0 N0 J0

Preflabel: NewtonianConstantOfGravity

Qudtentry: http://qudt.org/vocab/constant/NewtonianConstantOfGravitation

Relations:

- is_a metrology.MeasuredConstant

HyperfineTransitionFrequencyOfCs

IRI: http://emmo.info/emmo/middle/isq#EMMO_f96feb3f_4438_4e43_aa44_7458c4d87fc2

Elucidation: The frequency standard in the SI system in which the photon absorption by transitions between the two hyperfine ground states of caesium-133 atoms are used to control the output frequency.

It defines the base unit second in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?nucs

Physicaldimension: T-1 L0 M0 I0 Θ0 N0 J0

Preflabel: HyperfineTransitionFrequencyOfCs

Relations:

- is_a isq.Frequency
- is_a isq.SIExactConstant

AvogadroConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_176cae33_b83e_4cd2_a6bc_281f42f0ccc8

Elucidation: The number of constituent particles, usually atoms or molecules, that are contained in the amount of substance given by one mole.

It defines the base unit mole in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?na

Iupacentry: https://doi.org/10.1351/goldbook.A00543

Physicaldimension: T0 L0 M0 I0 Θ0 N-1 J0

Preflabel: AvogadroConstant

Qudtentry: http://qudt.org/vocab/constant/AvogadroConstant

Relations:

- is_a isq.SIExactConstant

RybergConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_a3c78d6f_ae49_47c8_a634_9b6d86b79382

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?ryd

Dbpediaentry: http://dbpedia.org/page/Rydberg_constant

Iupacentry: https://doi.org/10.1351/goldbook.R05430

Physicaldimension: T0 L-1 M0 I0 Θ0 N0 J0

Preflabel: RybergConstant

Qudtentry: http://qudt.org/vocab/constant/RydbergConstant

Relations:

- is_a isq.Wavenumber
- is_a metrology.MeasuredConstant

ProtonMass

IRI: http://emmo.info/emmo/middle/isq#EMMO_8d689295_7d84_421b_bc01_d5cceb2c2086

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?mp

Iupacentry: https://doi.org/10.1351/goldbook.P04914

Physicaldimension: T0 L0 M+1 I0 Θ0 N0 J0

Preflabel: ProtonMass

Qudtentry: http://qudt.org/vocab/constant/ProtonMass

Relations:

- is_a isq.Mass
- is_a metrology.MeasuredConstant

LuminousEfficacyOf540THzRadiation

IRI: http://emmo.info/emmo/middle/isq#EMMO_506f7823_52bc_40cb_be07_b3b1e10cce13

Elucidation: The luminous efficacy of monochromatic radiation of frequency 540 × 10 12 Hz, K cd , is a technical constant that gives an exact numerical relationship between the purely physical characteristics of the radiant power stimulating the human eye (W) and its photobiological response defined by the luminous flux due to the spectral responsivity of a standard observer (lm) at a frequency of 540 × 10 12 hertz.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?kcd

Physicaldimension: T+3 L-1 M-1 I0 Θ0 N0 J+1

Preflabel: LuminousEfficacyOf540THzRadiation

Relations:

- is_a isq.SIExactConstant

VacuumMagneticPermeability

IRI: http://emmo.info/emmo/middle/isq#EMMO_de021e4f_918f_47ef_a67b_11120f56b9d7

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?mu0

Physicaldimension: T-2 L+1 M+1 I-2 Θ0 N0 J0

Preflabel: VacuumMagneticPermeability

Qudtentry: http://qudt.org/vocab/constant/ElectromagneticPermeabilityOfVacuum

Relations:

- is_a isq.Permeability
- is_a metrology.MeasuredConstant

VacuumElectricPermittivity

IRI: http://emmo.info/emmo/middle/isq#EMMO_61a32ae9_8200_473a_bd55_59a9899996f4

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?ep0

Iupacentry: https://doi.org/10.1351/goldbook.P04508

Physicaldimension: T+4 L-3 M-1 I+2 Θ0 N0 J0

Preflabel: VacuumElectricPermittivity

Qudtentry: http://qudt.org/vocab/constant/PermittivityOfVacuum

Relations:

- is_a isq.Permittivity
- is_a metrology.MeasuredConstant

ElectronCharge

IRI: http://emmo.info/emmo/middle/isq#EMMO_cc01751d_dd05_429b_9d0c_1b7a74d1f277

Definition: The charge of an electron.

Iupacentry: https://doi.org/10.1351/goldbook.E01982

Physicaldimension: T+1 L0 M0 I+1 Θ0 N0 J0

Preflabel: ElectronCharge

Relations:

- is_a isq.ElectricCharge
- is_a isq.SIExactConstant

SIExactConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_f2ca6dd0_0e5f_4392_a92d_cafdae6cfc95

Elucidation: Physical constant that by definition (after the latest revision of the SI system that was enforsed May 2019) has a known exact numerical value when expressed in SI units.

Preflabel: SIExactConstant

Relations:

- is_a metrology.ExactConstant

ExactConstant

IRI: http://emmo.info/emmo/middle/metrology#EMMO_89762966_8076_4f7c_b745_f718d653e8e2

Preflabel: ExactConstant

Relations:

- is_a metrology.PhysicalConstant

MolarGasConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_ad6c76cf_b400_423e_820f_cf0c4e77f455

Elucidation: Equivalent to the Boltzmann constant, but expressed in units of energy per temperature increment per mole (rather than energy per temperature increment per particle).

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?r

Dbpediaentry: http://dbpedia.org/page/Gas_constant

Iupacentry: https://doi.org/10.1351/goldbook.G02579

Physicaldimension: T-2 L+2 M+1 I0 Θ-1 N-1 J0

Preflabel: MolarGasConstant

Qudtentry: http://qudt.org/vocab/constant/MolarGasConstant

Relations:

- is_a isq.SIExactConstant

PhysicalConstant

IRI: http://emmo.info/emmo/middle/metrology#EMMO_b953f2b1_c8d1_4dd9_b630_d3ef6580c2bb

Preflabel: PhysicalConstant

Wikipediaentry: https://en.wikipedia.org/wiki/List_of_physical_constants

Relations:

- is_a metrology.PhysicalQuantity
- disjoint_union_of metrology.MeasuredConstant, metrology.ExactConstant

FineStructureConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_d7d2ca25_03e1_4099_9220_c1a58df13ad0

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?alph

Dbpediaentry: http://dbpedia.org/page/Fine-structure_constant

Iupacentry: https://doi.org/10.1351/goldbook.F02389

Physicaldimension: T0 L0 M0 I0 Θ0 N0 J0

Preflabel: FineStructureConstant

Qudtentry: http://qudt.org/vocab/constant/FineStructureConstant

Relations:

- is_a metrology.MeasuredConstant

JosephsonConstant

IRI: http://emmo.info/emmo/middle/isq#EMMO_ba380bc6_2bfd_4f11_94c7_b3cbaafd1631

Elucidation: Inverse of the magnetic flux quantum.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?kjos

Physicaldimension: T+2 L-1 M-1 I+1 Θ0 N0 J0

Preflabel: JosephsonConstant

Qudtentry: http://qudt.org/vocab/constant/JosephsonConstant

Relations:

- is_a isq.SIExactConstant

ElementaryCharge

IRI: http://emmo.info/emmo/middle/isq#EMMO_58a650f0_a638_4743_8439_535a325e5c4c

Elucidation: The magnitude of the electric charge carried by a single electron. It defines the base unit Ampere in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?e

Dbpediaentry: http://dbpedia.org/page/Elementary_charge

Iupacentry: https://doi.org/10.1351/goldbook.E02032

Physicaldimension: T+1 L0 M0 I+1 Θ0 N0 J0

Preflabel: ElementaryCharge

Qudtentry: http://qudt.org/vocab/quantitykind/ElementaryCharge

Relations:

- is_a isq.ElectricCharge
- is_a isq.SIExactConstant

SpeedOfLightInVacuum

IRI: http://emmo.info/emmo/middle/isq#EMMO_99296e55_53f7_4333_9e06_760ad175a1b9

Elucidation: The speed of light in vacuum. Defines the base unit metre in the SI system.

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?c

Dbpediaentry: http://dbpedia.org/page/Speed_of_light

Iupacentry: https://doi.org/10.1351/goldbook.S05854

Physicaldimension: T-1 L+1 M0 I0 Θ0 N0 J0

Preflabel: SpeedOfLightInVacuum

Qudtentry: http://qudt.org/vocab/constant/SpeedOfLight_Vacuum

Relations:

- is_a isq.Speed
- is_a isq.SIExactConstant

ElectronMass

IRI: http://emmo.info/emmo/middle/isq#EMMO_44fc8c60_7a9c_49af_a046_e1878c88862c

Codataentry: https://physics.nist.gov/cgi-bin/cuu/Value?me

Dbpediaentry: http://dbpedia.org/page/Electron_rest_mass

Iupacentry: https://doi.org/10.1351/goldbook.E02008

Physicaldimension: T0 L0 M+1 I0 Θ0 N0 J0

Preflabel: ElectronMass

Qudtentry: http://qudt.org/vocab/constant/ElectronMass

Relations:

- is_a isq.Mass
- is_a metrology.MeasuredConstant

Reductionistic branch

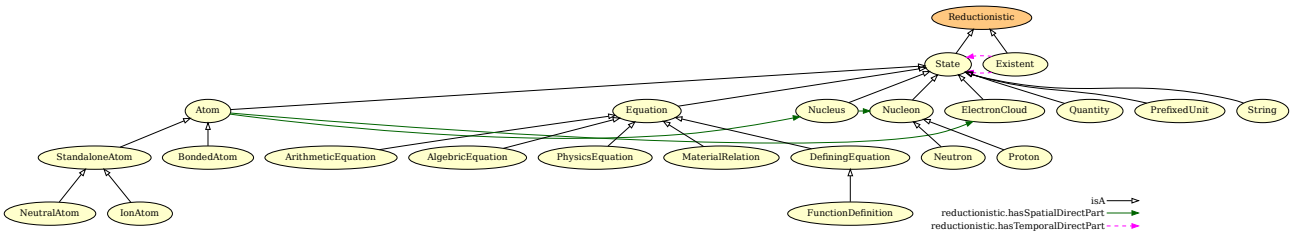


Figure 3.35: Reductionistic branch.

ArithmeticEquation

IRI: http://emmo.info/emmo/middle/math#EMMO_a6138ba7_e365_4f2d_b6b4_fe5a5918d403

Example: 1 + 1 = 2

Preflabel: ArithmeticEquation

Relations:

- is_a math.Equation

StandaloneAtom

IRI: http://emmo.info/emmo/middle/materials#EMMO_2fd3f574_5e93_47fe_afca_ed80b0a21ab4

Elucidation: An atom that does not share electrons with other atoms.

Preflabel: StandaloneAtom

Relations:

- is_a materials.Atom
- disjoint_union_of materials.NeutralAtom, materials.IonAtom

Atom

IRI: http://emmo.info/emmo/middle/materials#EMMO_eb77076b_a104_42ac_a065_798b2d2809ad

Elucidation: A standalone atom has direct part one ‘nucleus’ and one ‘electron_cloud’.

An O ‘atom’ within an O2 ‘molecule’ is an ‘e-bonded_atom’.

In this material branch, H atom is a particular case, with respect to higher atomic number atoms, since as soon as it shares its electron it has no nucleus entangled electron cloud.

We cannot say that H2 molecule has direct part two H atoms, but has direct part two H nucleus.

Preflabel: Atom

Relations:

- is_a physicalistic.Matter
- is_a reductionistic.State
- reductionistic.hasSpatialDirectPart some materials.ElectronCloud
- reductionistic.hasSpatialDirectPart some materials.Nucleus

Neutron

IRI: http://emmo.info/emmo/middle/materials#EMMO_df808271_df91_4f27_ba59_fa423c51896c

Preflabel: Neutron

Relations:

- is_a materials.Nucleon

BondedAtom

IRI: http://emmo.info/emmo/middle/materials#EMMO_8303a247_f9d9_4616_bdcd_f5cbd7b298e3

Elucidation: An bonded atom that shares at least one electron to the atom-based entity of which is part of.

Preflabel: BondedAtom

Relations:

- is_a materials.Atom

Existent

IRI: http://emmo.info/emmo/middle/reductionistic#EMMO_52211e5e_d767_4812_845e_eb6b402c476a

Elucidation: A ‘Physical’ which is a tessellation of ‘State’ temporal direct parts.

Preflabel: Existent

Relations:

- is_a reductionistic.Reductionistic
- reductionistic.hasTemporalDirectPart some reductionistic.State
- reductionistic.hasTemporalDirectPart only reductionistic.State

Nucleus

IRI: http://emmo.info/emmo/middle/materials#EMMO_f835f4d4_c665_403d_ab25_dca5cc74be52

Preflabel: Nucleus

Relations:

- is_a materials.Subatomic
- is_a reductionistic.State
- reductionistic.hasSpatialDirectPart some materials.Nucleon

AlgebricEquation

IRI: http://emmo.info/emmo/middle/math#EMMO_98d65021_4574_4890_b2fb_46430841077f

Example: 2 * a - b = c

Preflabel: AlgebricEquation

Relations:

- is_a math.Equation
- reductionistic.hasSpatialDirectPart some math.AlgebricExpression

State

IRI: http://emmo.info/emmo/middle/reductionistic#EMMO_36c79456_e29c_400d_8bd3_0eedddb82652

Elucidation: A 'Physical' which is a tessellation of spatial direct parts.

Example: e.g. the existent in my glass is declared at t = t_start as made of two direct parts: the ice and the water. It will continue to exists as state as long as the ice is completely melt at t = t_end. The new state will be completely made of water. Between t_start and t_end there is an exchange of molecules between the ice and the water, but this does not affect the existence of the two states.

If we partition the existent in my glass as ice surrounded by several molecules (we do not use the object water as direct part) then the appearance of a molecule coming from the ice will cause a state to end and another state to begin.

Preflabel: State

Relations:

- is_a reductionistic.Reductionistic
- reductionistic.hasSpatialDirectPart some physical.Physical

Reductionistic

IRI: http://emmo.info/emmo/middle/reductionistic#EMMO_15db234d_ecaf_4715_9838_4b4ec424fb13

Elucidation: A class devoted to categorize 'Physical'-s according to their granularity relations, first in terms of time evolution (Existent) and then in terms of their composition (State), up to the spatial a-tomistic element (Elementary).

Preflabel: Reductionistic

Relations:

- is_a top.Perspective
- equivalent_to reductionistic.State or reductionistic.Existent

Proton

IRI: http://emmo.info/emmo/middle/materials#EMMO_8f87e700_99a8_4427_8ffb_e493de05c217

Preflabel: Proton

Relations:

- is_a materials.Nucleon

PhysicsEquation

IRI: http://emmo.info/emmo/middle/models#EMMO_27c5d8c6_8af7_4d63_beb1_ec37cd8b3fa3

Elucidation: An 'equation' that stands for a 'physical_law' by mathematically defining the relations between physics_quantities.

Example: The Newton's equation of motion.

The Schrödinger equation.

The Navier-Stokes equation.

Preflabel: PhysicsEquation

Relations:

- is_a math.Equation
- is_a models.MathematicalModel
- reductionistic.hasSpatialDirectPart some metrology.PhysicalQuantity
- Inverse(models.hasModel) some models.PhysicalPhenomenon

MaterialRelation

IRI: http://emmo.info/emmo/middle/models#EMMO_e5438930_04e7_4d42_ade5_3700d4a52ab7

Elucidation: An 'equation' that stands for a physical assumption specific to a material, and provides an expression for a 'physics_quantity' (the dependent variable) as function of other variables, physics_quantity or data (independent variables).

Example: The Lennard-Jones potential.

A force field.

An Hamiltonian.

Preflabel: MaterialRelation

Relations:

- is_a math.Equation
- reductionistic.hasSpatialDirectPart some metrology.PhysicalQuantity

FunctionDefinition

IRI: http://emmo.info/emmo/middle/math#EMMO_4bc29b0f_8fcc_4026_a291_f9774a66d9b8

Elucidation: A function defined using functional notation.

Example: y = f(x)

Preflabel: FunctionDefinition

Relations:

- is_a math.DefiningEquation

Equation

IRI: http://emmo.info/emmo/middle/math#EMMO_e56ee3eb_7609_4ae1_8bed_51974f0960a6

Elucidation: The class of 'mathematical'-s that stand for a statement of equality between two mathematical expressions.

Example: 2+3 = 5 x^2 +3x = 5x dv/dt = a sin(x) = y

Preflabel: Equation

Relations:

- is_a math.MathematicalFormula
- is_a reductionistic.State
- is_a math.Mathematical
- reductionistic.hasSpatialDirectPart some math.Expression

ElectronCloud

IRI: http://emmo.info/emmo/middle/materials#EMMO_1067b97a_84f8_4d22_8ace_b842b8ce355c

Elucidation: A 'spacetime' that stands for a quantum system made of electrons.

Preflabel: ElectronCloud

Relations:

- is_a materials.Subatomic
- is_a reductionistic.State
- reductionistic.hasSpatialDirectPart some physicalistic.Electron

Nucleon

IRI: http://emmo.info/emmo/middle/materials#EMMO_50781fd9_a9e4_46ad_b7be_4500371d188d

Preflabel: Nucleon

Relations:

- is_a materials.Subatomic
- is_a reductionistic.State
- reductionistic.hasSpatialDirectPart some physicalistic.Quark
- disjoint_union_of materials.Proton, materials.Neutron

DefiningEquation

IRI: http://emmo.info/emmo/middle/math#EMMO_29afdf54_90ae_4c98_8845_fa9ea3f143a8

Elucidation: An equation that define a new variable in terms of other mathematical entities.

Example: The definition of velocity as v = dx/dt.

The definition of density as mass/volume.

y = f(x)

Preflabel: DefiningEquation

Relations:

- is_a math.Equation

IonAtom

IRI: http://emmo.info/emmo/middle/materials#EMMO_db03061b_db31_4132_a47a_6a634846578b

Elucidation: A standalone atom with an unbalanced number of electrons with respect to its atomic number.

Preflabel: IonAtom

Relations:

- is_a materials.StandaloneAtom

NeutralAtom

IRI: http://emmo.info/emmo/middle/materials#EMMO_4588526f_8553_4f4d_aa73_a483e88d599b

Elucidation: A standalone atom that has no net charge.

Preflabel: NeutralAtom

Relations:

- is_a materials.StandaloneAtom

String

IRI: http://emmo.info/emmo/middle/perceptual#EMMO_50ea1ec5_f157_41b0_b46b_a9032f17ca10

Elucidation: A physical made of more than one symbol sequentially arranged.

Example: The word “cat” considered as a collection of ‘symbol’-s respecting the rules of english language.

In this example the ‘symbolic’ entity “cat” is not related to the real cat, but it is only a word (like it would be to an italian person that ignores the meaning of this english word).

If an ‘interpreter’ skilled in english language is involved in a ‘semiotic’ process with this word, that “cat” became also a ‘sign’ i.e. it became for the ‘interpreter’ a representation for a real cat.

Preflabel: String

Relations:

- is_a perceptual.SymbolicComposition

- is_a reductionistic.State
- reductionistic.hasSpatialDirectPart some perceptual.Symbol
- reductionistic.hasSpatialDirectPart only perceptual.Symbol

Expression branch

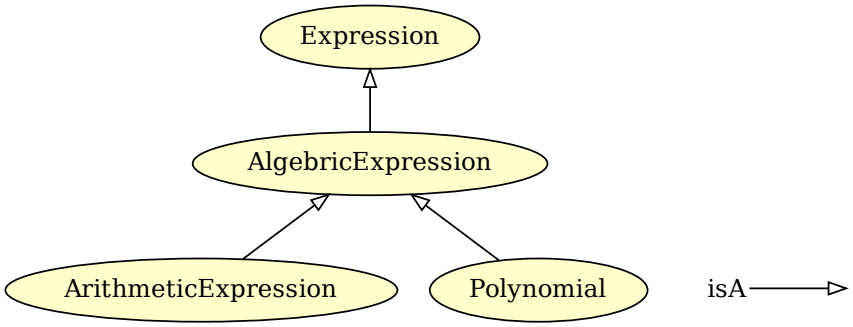


Figure 3.36: Expression branch.

AlgebricExpression

IRI: http://emmo.info/emmo/middle/math#EMMO_1aed91a3_d00c_48af_8f43_a0c958b2512a

Example: 2x+3

Preflabel: AlgebricExpression

Relations:

- is_a math.Expression

Expression

IRI: http://emmo.info/emmo/middle/math#EMMO_f9bc8b52_85e9_4b53_b969_dd7724d5b8e4

Elucidation: A well-formed finite combination of mathematical symbols according to some specific rules.

Preflabel: Expression

Relations:

- is_a math.Mathematical
- is_a perceptual.SymbolicComposition

ArithmeticExpression

IRI: http://emmo.info/emmo/middle/math#EMMO_89083bab_f69c_4d06_bf6d_62973b56cdc7

Example: 2+2

Preflabel: ArithmeticExpression

Relations:

- is_a math.AlgebricExpression
- is_a not reductionistic.hasSpatialDirectPart some math.Variable

Polynomial

IRI: http://emmo.info/emmo/middle/math#EMMO_91447ec0_fb55_49f2_85a5_3172dff6482c

Example: 2 * x^2 + x + 3

Preflabel: Polynomial

Relations:

- is_a math.AlgebricExpression

Physicalistic branch

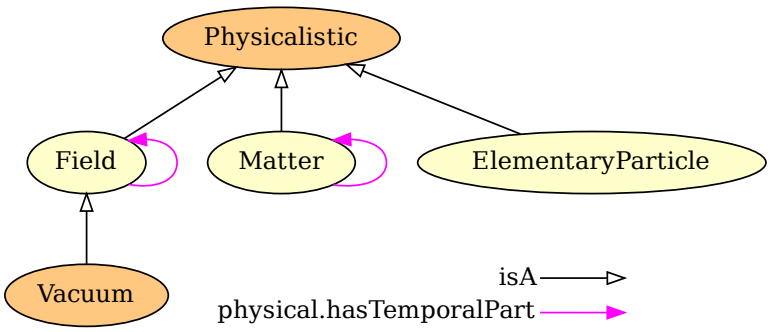


Figure 3.37: Physicalistic branch.

Vacuum

IRI: http://emmo.info/emmo/middle/physicalistic#EMMO_3c218fbe_60c9_4597_8bcf_41eb1773af1f

Elucidation: A 'Physical' with no 'Massive' parts.

Preflabel: Vacuum

Relations:

- is_a physicalistic.Field
- equivalent_to physicalistic.Field and not physicalistic.Matter

Field

IRI: http://emmo.info/emmo/middle/physicalistic#EMMO_70dac51e_bddd_48c2_8a98_7d8395e91fc2

Elucidation: A 'Physical' with 'Massless' parts that are mediators of interactions.

Preflabel: Field

Relations:

- is_a physicalistic.Physicalistic
- is_a physical.Physical
- mereotopology.hasPart some physicalistic.Massless
- physical.hasTemporalPart only physicalistic.Field

Physicalistic

IRI: http://emmo.info/emmo/middle/physicalistic#EMMO_98ada9d8_f1c8_4f13_99b5_d890f5354152

Elucidation: The perspective for which physical objects are categorized only by concepts coming from applied physical sciences.

Preflabel: Physicalistic

Relations:

- is_a top.Perspective
- equivalent_to physicalistic.Matter or physicalistic.Field

Elementary Particle branch

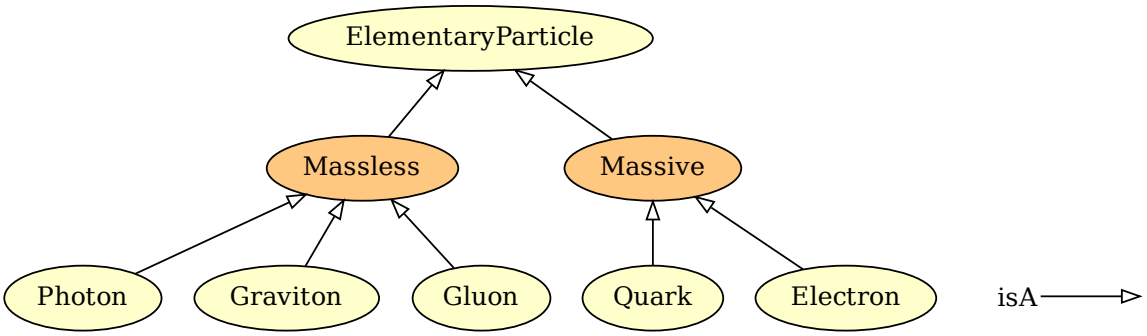


Figure 3.38: Elementary Particle branch.

Photon

IRI: http://emmo.info/emmo/middle/physicalistic#EMMO_25f8b804_9a0b_4387_a3e7_b35bce5365ee

Elucidation: The class of individuals that stand for photons elementary particles.

Preflabel: Photon

Relations:

- is_a physicalistic.Massless
- is_a physical.Elementary

Quark

IRI: http://emmo.info/emmo/middle/physicalistic#EMMO_72d53756_7fb1_46ed_980f_83f47efbe105

Elucidation: The class of individuals that stand for quarks elementary particles.

Preflabel: Quark

Relations:

- is_a physicalistic.Massive
- is_a physical.Elementary

Graviton

IRI: http://emmo.info/emmo/middle/physicalistic#EMMO_eb3c61f0_3983_4346_a0c6_e7f6b90a67a8

Elucidation: The class of individuals that stand for gravitons elementary particles.

Preflabel: Graviton

Relations:

- is_a physicalistic.Massless
- is_a physical.Elementary

Massless

IRI: http://emmo.info/emmo/middle/physicalistic#EMMO_e5488299_8dab_4ebb_900a_26d2abed8396

Elucidation: The union of classes of elementary particles that do not possess mass.

Preflabel: Massless

Relations:

- is_a physicalistic.ElementaryParticle
- equivalent_to physicalistic.Photon or physicalistic.Gluon or physicalistic.Graviton

Electron

IRI: http://emmo.info/emmo/middle/physicalistic#EMMO_8043d3c6_a4c1_4089_ba34_9744e28e5b3d

Elucidation: The class of individuals that stand for electrons elemntary particles.

Preflabel: Electron

Relations:

- is_a physicalistic.Massive
- is_a physical.Elementary

Massive

IRI: http://emmo.info/emmo/middle/physicalistic#EMMO_385b8f6e_43ac_4596_ad76_ac322c68b7ca

Elucidation: The union of classes of elementary particles that possess mass.

Preflabel: Massive

Relations:

- is_a physicalistic.ElementaryParticle
- equivalent_to physicalistic.Quark or physicalistic.Electron

Gluon

IRI: http://emmo.info/emmo/middle/physicalistic#EMMO_7db59e56_f68b_48b7_ae99_891c35ae5c3b

Elucidation: The class of individuals that stand for gluons elementary particles.

Preflabel: Gluon

Relations:

- is_a physicalistic.Massless
- is_a physical.Elementary

ElementaryParticle

IRI: http://emmo.info/emmo/middle/physicalistic#EMMO_c26a0340_d619_4928_b1a1_1a04e88bb89d

Elucidation: The union of all classes categorizing elementary particles according to the Standard Model.

Preflabel: ElementaryParticle

Relations:

- is_a physicalistic.Physicalistic
- is_a physical.Elementary
- disjoint_union_of physicalistic.Photon, physicalistic.Quark, physicalistic.Gluon, physicalistic.Electron, physicalistic.Graviton

Subatomic branch

Neutron

IRI: http://emmo.info/emmo/middle/materials#EMMO_df808271_df91_4f27_ba59_fa423c51896c

Preflabel: Neutron

Relations:

- is_a materials.Nucleon

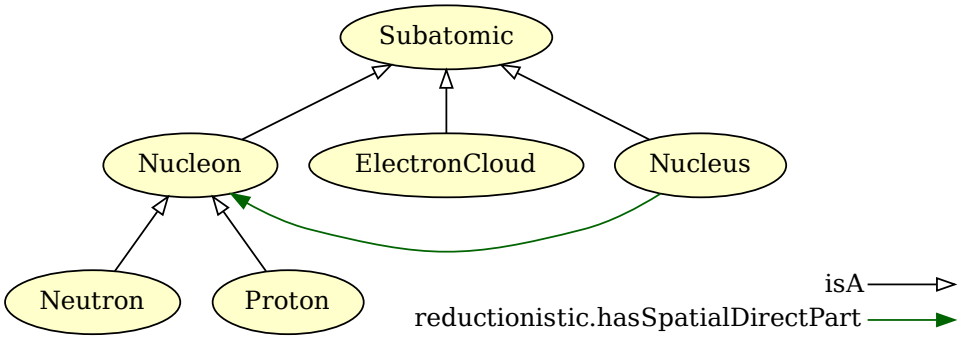


Figure 3.39: Subatomic branch.

ElectronCloud

IRI: http://emmo.info/emmo/middle/materials#EMMO_1067b97a_84f8_4d22_8ace_b842b8ce355c

Elucidation: A 'spacetime' that stands for a quantum system made of electrons.

Preflabel: ElectronCloud

Relations:

- is_a materials.Subatomic
- is_a reductionistic.State
- reductionistic.hasSpatialDirectPart some physicalistic.Electron

Nucleon

IRI: http://emmo.info/emmo/middle/materials#EMMO_50781fd9_a9e4_46ad_b7be_4500371d188d

Preflabel: Nucleon

Relations:

- is_a materials.Subatomic
- is_a reductionistic.State
- reductionistic.hasSpatialDirectPart some physicalistic.Quark
- disjoint_union_of materials.Proton, materials.Neutron

Nucleus

IRI: http://emmo.info/emmo/middle/materials#EMMO_f835f4d4_c665_403d_ab25_dca5cc74be52

Preflabel: Nucleus

Relations:

- is_a materials.Subatomic
- is_a reductionistic.State
- reductionistic.hasSpatialDirectPart some materials.Nucleon

Proton

IRI: http://emmo.info/emmo/middle/materials#EMMO_8f87e700_99a8_4427_8ffb_e493de05c217

Preflabel: Proton

Relations:

- is_a materials.Nucleon

Subatomic

IRI: http://emmo.info/emmo/middle/materials#EMMO_7d66bde4_b68d_41cc_b5fc_6fd98c5e2ff0

Preflabel: Subatomic

Relations:

- is_a physicalistic.Matter

Matter branch

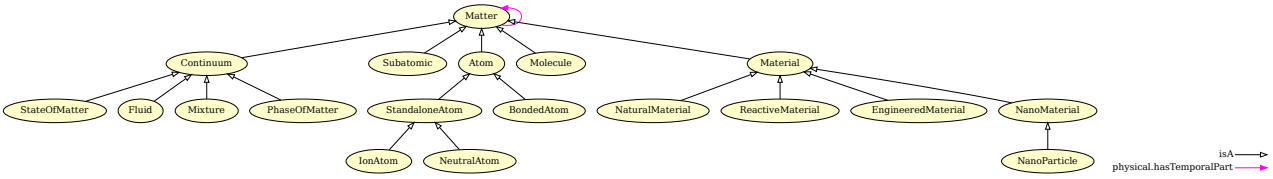


Figure 3.40: Matter branch.

StandaloneAtom

IRI: http://emmo.info/emmo/middle/materials#EMMO_2fd3f574_5e93_47fe_afca_ed80b0a21ab4

Elucidation: An atom that does not share electrons with other atoms.

Preflabel: StandaloneAtom

Relations:

- is_a materials.Atom
- disjoint_union_of materials.NeutralAtom, materials.IonAtom

NeutralAtom

IRI: http://emmo.info/emmo/middle/materials#EMMO_4588526f_8553_4f4d_aa73_a483e88d599b

Elucidation: A standalone atom that has no net charge.

Preflabel: NeutralAtom

Relations:

- is_a materials.StandaloneAtom

NaturalMaterial

IRI: http://emmo.info/emmo/middle/materials#EMMO_75fe4fd1_0f7e_429b_b91d_59d248561bae

Elucidation: A Material occurring in nature, without the need of human intervention.

Preflabel: NaturalMaterial

Relations:

- is_a physicalistic.Material

ReactiveMaterial

IRI: http://emmo.info/emmo/middle/materials#EMMO_68390bfb_e307_479d_8f78_d66d8773cb1d

Elucidation: A material that undergoes chemical changes.

Preflabel: ReactiveMaterial

Relations:

- is_a physicalistic.Material

Atom

IRI: http://emmo.info/emmo/middle/materials#EMMO_eb77076b_a104_42ac_a065_798b2d2809ad

Elucidation: A standalone atom has direct part one 'nucleus' and one 'electron_cloud'.

An O 'atom' within an O2 'molecule' is an 'e-bonded_atom'.

In this material branch, H atom is a particular case, with respect to higher atomic number atoms, since as soon as it shares its electron it has no nucleus entangled electron cloud.

We cannot say that H2 molecule has direct part two H atoms, but has direct part two H nucleus.

Preflabel: Atom

Relations:

- is_a physicalistic.Matter
- is_a reductionistic.State
- reductionistic.hasSpatialDirectPart some materials.ElectronCloud
- reductionistic.hasSpatialDirectPart some materials.Nucleus

Continuum

IRI: http://emmo.info/emmo/middle/materials#EMMO_8b0923ab_b500_477b_9ce9_8b3a3e4dc4f2

Elucidation: A state that is a collection of sufficiently large number of other parts such that: - it is the bearer of qualities that can exists only by the fact that it is a sum of parts - the smallest partition dV of the state volume in which we are interested in, contains enough parts to be statistically consistent: n [#/m3] x dV [m3] >> 1

Preflabel: Continuum

Relations:

- is_a physicalistic.Matter

Matter

IRI: http://emmo.info/emmo/middle/physicalistic#EMMO_5b2222df_4da6_442f_8244_96e9e45887d1

Elucidation: A 'Physical' that possesses some 'Massive' parts.

Preflabel: Matter

Relations:

- is_a physicalistic.Physicalistic
- is_a physical.Physical
- mereotopology.hasPart some physicalistic.Massive
- physical.hasTemporalPart only physicalistic.Matter

PhaseOfMatter

IRI: http://emmo.info/emmo/middle/materials#EMMO_668fbd5b_6f1b_405c_9c6b_d6067bd0595a

Elucidation: A matter object throughout which all physical properties of a material are essentially uniform.

Preflabel: PhaseOfMatter

Relations:

- is_a materials.Continuum
- is_a physicalistic.Matter

EngineeredMaterial

IRI: http://emmo.info/emmo/middle/manufacturing#EMMO_ec7464a9_d99d_45f8_965b_4e9230ea8356

Preflabel: EngineeredMaterial

Relations:

- is_a manufacturing.Engineered
- is_a physicalistic.Material
- Inverse(holistic.hasProperParticipant) some manufacturing.ContinuumManufacturing

Molecule

IRI: http://emmo.info/emmo/middle/materials#EMMO_3397f270_dfc1_4500_8f6f_4d0d85ac5f71

Elucidation: An atom_based state defined by an exact number of e-bonded atomic species and an electron cloud made of the shared electrons.

Example: H20, C6H12O6, CH4

Preflabel: Molecule

Relations:

- is_a physicalistic.Matter

NanoParticle

IRI: http://emmo.info/emmo/middle/materials#EMMO_10dd1eed_da7d_45a3_860c_477ca9e152aa

Elucidation: Nanomaterials are Materials possessing all external dimension measuring 1-100nm

Preflabel: NanoParticle

Relations:

- is_a materials.NanoMaterial

IonAtom

IRI: http://emmo.info/emmo/middle/materials#EMMO_db03061b_db31_4132_a47a_6a634846578b

Elucidation: A standalone atom with an unbalanced number of electrons with respect to its atomic number.

Preflabel: IonAtom

Relations:

- is_a materials.StandaloneAtom

BondedAtom

IRI: http://emmo.info/emmo/middle/materials#EMMO_8303a247_f9d9_4616_bdcd_f5cbd7b298e3

Elucidation: An bonded atom that shares at least one electron to the atom-based entity of which is part of.

Preflabel: BondedAtom

Relations:

- is_a materials.Atom

Material

IRI: http://emmo.info/emmo/middle/physicalistic#EMMO_4207e895_8b83_4318_996a_72cfb32acd94

Elucidation: A matter individual that stands for a real world object representing an amount of a physical substance (or mixture of substances) in different states of matter or phases.

Preflabel: Material

Relations:

- is_a physicalistic.Matter

NanoMaterial

IRI: http://emmo.info/emmo/middle/materials#EMMO_5d659e25_a508_43ed_903c_3707c7c7cd4b

Elucidation: Nanomaterials are Materials possessing, at minimum, one external dimension measuring 1-100nm

Preflabel: NanoMaterial

Relations:

- is_a physicalistic.Material

Fluid branch

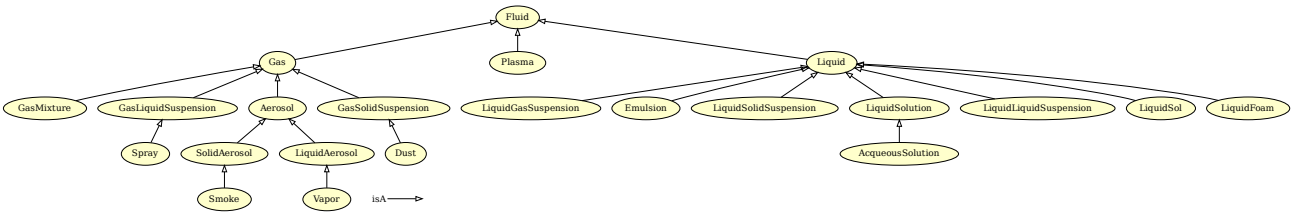


Figure 3.41: Fluid branch.

Vapor

IRI: http://emmo.info/emmo/middle/materials#EMMO_4d604a13_d1f6_42fd_818f_d3138d5e308c

Elucidation: A liquid aerosol composed of water droplets in air or another gas.

Preflabel: Vapor

Relations:

- is_a materials.LiquidAerosol

GasSolidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_d4f37e32_16ae_4cc6_b4cd_fd896b2449c4

Elucidation: A coarse dispersion of solid in a gas continuum phase.

Example: Dust, sand storm.

Preflabel: GasSolidSuspension

Relations:

- is_a materials.Gas
- is_a materials.Suspension

Smoke

IRI: http://emmo.info/emmo/middle/materials#EMMO_5a2af26d_99de_4e5e_b1cd_514be71420c3

Elucidation: Smoke is a solid aerosol made of particles emitted when a material undergoes combustion or pyrolysis.

Preflabel: Smoke

Relations:

- is_a materials.SolidAerosol

Fluid

IRI: http://emmo.info/emmo/middle/materials#EMMO_87ac88ff_8379_4f5a_8c7b_424a8fff1ee8

Elucidation: A continuum that has no fixed shape and yields easily to external pressure.

Example: Gas, liquid, plasma,

Preflabel: Fluid

Relations:

- is_a materials.Continuum

LiquidAerosol

IRI: http://emmo.info/emmo/middle/materials#EMMO_94010cbc_c2a6_4cb9_b29a_83aa99d2ff70

Elucidation: An aerosol composed of liquid droplets in air or another gas.

Preflabel: LiquidAerosol

Relations:

- is_a materials.Aerosol

GasMixture

IRI: http://emmo.info/emmo/middle/materials#EMMO_5be9c137_325a_43d8_b7cd_ea93e7721c2d

Elucidation: A gaseous solution made of more than one component type.

Preflabel: GasMixture

Relations:

- is_a materials.Gas
- is_a materials.Solution

AcqueousSolution

IRI: http://emmo.info/emmo/middle/materials#EMMO_5cb107ba_7daa_46dd_8f9f_da22a6eac676

Elucidation: A liquid solution in which the solvent is water.

Preflabel: AcqueousSolution

Relations:

- is_a materials.LiquidSolution

SolidAerosol

IRI: http://emmo.info/emmo/middle/materials#EMMO_96c8d72f_b436_44e2_9f7f_085c24094292

Elucidation: An aerosol composed of fine solid particles in air or another gas.

Preflabel: SolidAerosol

Relations:

- is_a materials.Aerosol

LiquidSolution

IRI: http://emmo.info/emmo/middle/materials#EMMO_4b3e2374_52a1_4420_8e3f_3ae6b9bf7dff

Elucidation: A liquid solution made of two or more component substances.

Preflabel: LiquidSolution

Relations:

- is_a materials.Solution

- is_a materials.Liquid

Aerosol

IRI: http://emmo.info/emmo/middle/materials#EMMO_560d833a_6184_410c_859a_05d982712fd7

Elucidation: A colloid composed of fine solid particles or liquid droplets in air or another gas.

Preflabel: Aerosol

Relations:

- is_a materials.Gas
- is_a materials.Colloid

LiquidLiquidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_47fe2379_be21_48d1_9ede_402f0faf494b

Elucidation: A coarse dispersion of liquid in a liquid continuum phase.

Preflabel: LiquidLiquidSuspension

Relations:

- is_a materials.Suspension
- is_a materials.Liquid

Spray

IRI: http://emmo.info/emmo/middle/materials#EMMO_498aad49_f8d4_40a4_a9eb_efd563a0115f

Elucidation: A suspension of liquid droplets dispersed in a gas through an atomization process.

Preflabel: Spray

Relations:

- is_a materials.GasLiquidSuspension

Dust

IRI: http://emmo.info/emmo/middle/materials#EMMO_e4281979_2b07_4a43_a772_4903fb3696fe

Elucidation: A suspension of fine particles in the atmosphere.

Preflabel: Dust

Relations:

- is_a materials.GasSolidSuspension

Plasma

IRI: http://emmo.info/emmo/middle/materials#EMMO_4c21fb86_fdcf_444e_b498_86fe656295af

Elucidation: A fluid in which a gas is ionized to a level where its electrical conductivity allows long-range electric and magnetic fields to dominate its behaviour.

Preflabel: Plasma

Relations:

- is_a materials.Fluid
- is_a materials.StateOfMatter

LiquidSol

IRI: http://emmo.info/emmo/middle/materials#EMMO_4354ac74_7425_43ab_92e4_6dc19d1afee9

Elucidation: A type of sol in the form of one solid dispersed in liquid.

Preflabel: LiquidSol

Relations:

- is_a materials.Sol
- is_a materials.Liquid

GasLiquidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_e0edfb9e_9a96_4fae_b942_831ffe27b84a

Elucidation: A coarse dispersion of liquid in a gas continuum phase.

Example: Rain, spray.

Preflabel: GasLiquidSuspension

Relations:

- is_a materials.Gas
- is_a materials.Suspension

LiquidFoam

IRI: http://emmo.info/emmo/middle/materials#EMMO_d69d2e95_b22f_499a_a552_17fde0d778fc

Elucidation: A foam of trapped gas in a liquid.

Preflabel: LiquidFoam

Relations:

- is_a materials.Foam
- is_a materials.Liquid

LiquidGasSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_42185fe7_122c_4e0c_a3cd_659d3e21c389

Elucidation: A coarse dispersion of gas in a liquid continuum phase.

Example: Sparkling water

Preflabel: LiquidGasSuspension

Relations:

- is_a materials.Suspension
- is_a materials.Liquid

Emulsion

IRI: http://emmo.info/emmo/middle/materials#EMMO_40e18c93_a1b5_49ff_b06a_d9d932d1fb65

Elucidation: An emulsion is a mixture of two or more liquids that are normally immiscible (a liquid-liquid heterogeneous mixture).

Example: Mayonnaise, milk.

Preflabel: Emulsion

Relations:

- is_a materials.Colloid
- is_a materials.Liquid

Liquid

IRI: http://emmo.info/emmo/middle/materials#EMMO_7509da43_56b1_4d7f_887a_65d1663df4ba

Elucidation: A liquid is a nearly incompressible fluid that conforms to the shape of its container but retains a (nearly) constant volume independent of pressure.

Preflabel: Liquid

Relations:

- is_a materials.Fluid
- is_a materials.StateOfMatter

Gas

IRI: http://emmo.info/emmo/middle/materials#EMMO_04f2a2d5_e799_4692_a654_420e76f5acc1

Elucidation: Gas is a compressible fluid, a state of matter that has no fixed shape and no fixed volume.

Preflabel: Gas

Relations:

- is_a materials.Fluid
- is_a materials.StateOfMatter

LiquidSolidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_e9e02156_651f_41c8_9efb_d5da0d4ce5e2

Elucidation: A coarse dispersion of solids in a liquid continuum phase.

Example: Mud

Preflabel: LiquidSolidSuspension

Relations:

- is_a materials.Suspension
- is_a materials.Liquid

Mixture branch

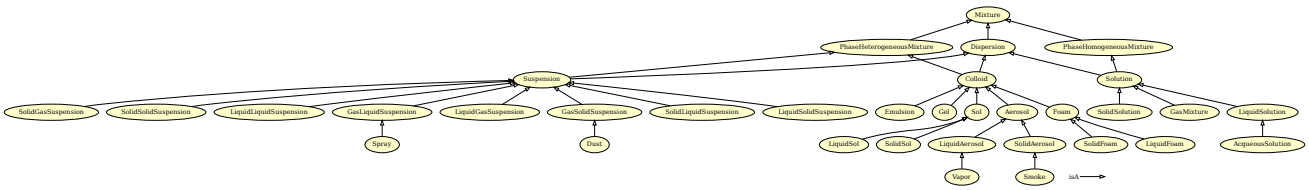


Figure 3.42: Mixture branch.

Vapor

IRI: http://emmo.info/emmo/middle/materials#EMMO_4d604a13_d1f6_42fd_818f_d3138d5e308c

Elucidation: A liquid aerosol composed of water droplets in air or another gas.

Preflabel: Vapor

Relations:

- is_a materials.LiquidAerosol

GasSolidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_d4f37e32_16ae_4cc6_b4cd_fd896b2449c4

Elucidation: A coarse dispersion of solid in a gas continuum phase.

Example: Dust, sand storm.

Preflabel: GasSolidSuspension

Relations:

- is_a materials.Gas
- is_a materials.Suspension

SolidSolution

IRI: http://emmo.info/emmo/middle/materials#EMMO_5e77f00d_5c0a_44e7_baf1_2c2a4cb5b3ae

Elucidation: A solid solution made of two or more component substances.

Preflabel: SolidSolution

Relations:

- is_a materials.Solution
- is_a materials.Solid

Smoke

IRI: http://emmo.info/emmo/middle/materials#EMMO_5a2af26d_99de_4e5e_b1cd_514be71420c3

Elucidation: Smoke is a solid aerosol made of particles emitted when a material undergoes combustion or pyrolysis.

Preflabel: Smoke

Relations:

- is_a materials.SolidAerosol

GasMixture

IRI: http://emmo.info/emmo/middle/materials#EMMO_5be9c137_325a_43d8_b7cd_ea93e7721c2d

Elucidation: A gaseous solution made of more than one component type.

Preflabel: GasMixture

Relations:

- is_a materials.Gas
- is_a materials.Solution

LiquidSolution

IRI: http://emmo.info/emmo/middle/materials#EMMO_4b3e2374_52a1_4420_8e3f_3ae6b9bf7dff

Elucidation: A liquid solution made of two or more component substances.

Preflabel: LiquidSolution

Relations:

- is_a materials.Solution
- is_a materials.Liquid

Suspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_4a464c8d_8895_44a8_a628_aed13509f1bd

Elucidation: An heterogeneous mixture that contains coarsly dispersed particles (no Tyndall effect), that generally tend to separate in time to the dispersion medium phase.

Preflabel: Suspension

Relations:

- is_a materials.Dispersion
- is_a materials.PhaseHeterogeneousMixture
- is_a materials.StateOfMatter
- disjoint_union_of materials.SolidSolidSuspension, materials.SolidLiquidSuspension, materials.LiquidGasSuspension, materials.LiquidLiquidSuspension, materials.SolidGasSuspension, materials.GasSolidSuspension, materials.GasLiquidSuspension, materials.LiquidSolidSuspension

Aerosol

IRI: http://emmo.info/emmo/middle/materials#EMMO_560d833a_6184_410c_859a_05d982712fd7

Elucidation: A colloid composed of fine solid particles or liquid droplets in air or another gas.

Preflabel: Aerosol

Relations:

- is_a materials.Gas
- is_a materials.Colloid

Spray

IRI: http://emmo.info/emmo/middle/materials#EMMO_498aad49_f8d4_40a4_a9eb_efd563a0115f

Elucidation: A suspension of liquid droplets dispersed in a gas through an atomization process.

Preflabel: Spray

Relations:

- is_a materials.GasLiquidSuspension

Dust

IRI: http://emmo.info/emmo/middle/materials#EMMO_e4281979_2b07_4a43_a772_4903fb3696fe

Elucidation: A suspension of fine particles in the atmosphere.

Preflabel: Dust

Relations:

- is_a materials.GasSolidSuspension

Solution

IRI: http://emmo.info/emmo/middle/materials#EMMO_2031516a_2be7_48e8_9af7_7e1270e308fe

Elucidation: A solution is a homogeneous mixture composed of two or more substances.

Preflabel: Solution

Relations:

- is_a materials.Dispersion
- is_a materials.PhaseHomogeneousMixture

LiquidSol

IRI: http://emmo.info/emmo/middle/materials#EMMO_4354ac74_7425_43ab_92e4_6dc19d1afee9

Elucidation: A type of sol in the form of one solid dispersed in liquid.

Preflabel: LiquidSol

Relations:

- is_a materials.Sol
- is_a materials.Liquid

SolidFoam

IRI: http://emmo.info/emmo/middle/materials#EMMO_9bed5d66_805a_4b3a_9153_beaf67143848

Elucidation: A foam of trapped gas in a solid.

Example: Aerogel

Preflabel: SolidFoam

Relations:

- is_a materials.Foam
- is_a materials.Solid

Dispersion

IRI: http://emmo.info/emmo/middle/materials#EMMO_0b15f4ae_092e_4487_9100_3c44176c545c

Elucidation: A material in which distributed particles of one phase are dispersed in a different continuous phase.

Preflabel: Dispersion

Relations:

- is_a materials.Mixture
- disjoint_union_of materials.Solution, materials.Suspension, materials.Colloid

SolidLiquidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_33e0ac8b_a318_4285_b1de_e95347784632

Elucidation: A coarse dispersion of liquid in a solid continuum phase.

Preflabel: SolidLiquidSuspension

Relations:

- is_a materials.Suspension
- is_a materials.Solid

LiquidSolidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_e9e02156_651f_41c8_9efb_d5da0d4ce5e2

Elucidation: A coarse dispersion of solids in a liquid continuum phase.

Example: Mud

Preflabel: LiquidSolidSuspension

Relations:

- is_a materials.Suspension
- is_a materials.Liquid

Colloid

IRI: http://emmo.info/emmo/middle/materials#EMMO_6c487fb3_03d1_4e56_91ed_c2e16dcbef60

Elucidation: A mixture in which one substance of microscopically dispersed insoluble or soluble particles (from 1 nm to 1 μm) is suspended throughout another substance and that does not settle, or would take a very long time to settle appreciably.

Preflabel: Colloid

Relations:

- is_a materials.Dispersion
- is_a materials.PhaseHeterogeneousMixture

AcqueousSolution

IRI: http://emmo.info/emmo/middle/materials#EMMO_5cb107ba_7daa_46dd_8f9f_da22a6eac676

Elucidation: A liquid solution in which the solvent is water.

Preflabel: AcqueousSolution

Relations:

- is_a materials.LiquidSolution

LiquidAerosol

IRI: http://emmo.info/emmo/middle/materials#EMMO_94010cbc_c2a6_4cb9_b29a_83aa99d2ff70

Elucidation: An aerosol composed of liquid droplets in air or another gas.

Preflabel: LiquidAerosol

Relations:

- is_a materials.Aerosol

SolidSol

IRI: http://emmo.info/emmo/middle/materials#EMMO_5add9885_dc98_4fa5_8482_fdf9ba5e3889

Elucidation: A type of sol in the form of one solid dispersed in another continuous solid.

Preflabel: SolidSol

Relations:

- is_a materials.Sol
- is_a materials.Solid

SolidGasSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_c457b6b9_5e73_4853_ae08_d776c12b8058

Elucidation: A coarse dispersion of gas in a solid continuum phase.

Preflabel: SolidGasSuspension

Relations:

- is_a materials.Suspension
- is_a materials.Solid

SolidAerosol

IRI: http://emmo.info/emmo/middle/materials#EMMO_96c8d72f_b436_44e2_9f7f_085c24094292

Elucidation: An aerosol composed of fine solid particles in air or another gas.

Preflabel: SolidAerosol

Relations:

- is_a materials.Aerosol

SolidSolidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_2dd512a1_5187_47cc_b0b8_141214e22b59

Elucidation: A coarse dispersion of solid in a solid continuum phase.

Example: Granite, sand, dried concrete.

Preflabel: SolidSolidSuspension

Relations:

- is_a materials.Suspension
- is_a materials.Solid

LiquidLiquidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_47fe2379_be21_48d1_9ede_402f0faf494b

Elucidation: A coarse dispersion of liquid in a liquid continuum phase.

Preflabel: LiquidLiquidSuspension

Relations:

- is_a materials.Suspension
- is_a materials.Liquid

PhaseHeterogeneousMixture

IRI: http://emmo.info/emmo/middle/materials#EMMO_0e030040_98a7_49b2_a871_dced1f3a6131

Elucidation: A mixture in which more than one phases of matter cohexists.

Preflabel: PhaseHeterogeneousMixture

Relations:

- is_a materials.Mixture
- mereotopology.hasProperPart some materials.PhaseOfMatter

GasLiquidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_e0edfb9e_9a96_4fae_b942_831ffe27b84a

Elucidation: A coarse dispersion of liquid in a gas continuum phase.

Example: Rain, spray.

Preflabel: GasLiquidSuspension

Relations:

- is_a materials.Gas
- is_a materials.Suspension

LiquidFoam

IRI: http://emmo.info/emmo/middle/materials#EMMO_d69d2e95_b22f_499a_a552_17fde0d778fc

Elucidation: A foam of trapped gas in a liquid.

Preflabel: LiquidFoam

Relations:

- is_a materials.Foam
- is_a materials.Liquid

Foam

IRI: http://emmo.info/emmo/middle/materials#EMMO_1f5e3e7e_72c9_40d4_91dd_ae432d7b7018

Elucidation: A colloid formed by trapping pockets of gas in a liquid or solid.

Preflabel: Foam

Relations:

- is_a materials.Colloid

LiquidGasSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_42185fe7_122c_4e0c_a3cd_659d3e21c389

Elucidation: A coarse dispersion of gas in a liquid continuum phase.

Example: Sparkling water

Preflabel: LiquidGasSuspension

Relations:

- is_a materials.Suspension
- is_a materials.Liquid

PhaseHomogeneousMixture

IRI: http://emmo.info/emmo/middle/materials#EMMO_0e6378df_1ce8_4321_b00c_ee9beea60a67

Elucidation: A single phase mixture.

Preflabel: PhaseHomogeneousMixture

Relations:

- is_a materials.Mixture

Emulsion

IRI: http://emmo.info/emmo/middle/materials#EMMO_40e18c93_a1b5_49ff_b06a_d9d932d1fb65

Elucidation: An emulsion is a mixture of two or more liquids that are normally immiscible (a liquid-liquid heterogeneous mixture).

Example: Mayonnaise, milk.

Preflabel: Emulsion

Relations:

- is_a materials.Colloid
- is_a materials.Liquid

Gel

IRI: http://emmo.info/emmo/middle/materials#EMMO_3995e22d_5720_4dcf_ba3b_d0ce03f514c6

Elucidation: A soft, solid or solid-like colloid consisting of two or more components, one of which is a liquid, present in substantial quantity.

Preflabel: Gel

Relations:

- is_a materials.Colloid
- is_a materials.Solid

Mixture

IRI: http://emmo.info/emmo/middle/materials#EMMO_ec2c8ac8_98c5_4c74_b85b_ff8e8ca6655c

Elucidation: A Miixture is a material made up of two or more different substances which are physically (not chemically) combined.

Preflabel: Mixture

Relations:

- is_a materials.Continuum

Sol

IRI: http://emmo.info/emmo/middle/materials#EMMO_31557fae_b039_491c_bcbb_0ccb8711d5a6

Elucidation: A colloid in which small particles (1 nm to 100 nm) are suspended in a continuum phase.

Preflabel: Sol

Relations:

- is_a materials.Colloid

State Of Matter branch

Figure 3.43: State Of Matter branch.

StateOfMatter

IRI: http://emmo.info/emmo/middle/materials#EMMO_b9695e87_8261_412e_83cd_a86459426a28

Elucidation: A superclass made as the disjoint union of all the form under which matter can exist.

Preflabel: StateOfMatter

Relations:

- is_a materials.Continuum
- is_a physicalistic.Matter
- disjoint_union_of materials.Gas, materials.Plasma, materials.Liquid, materials.Solid

Vapor

IRI: http://emmo.info/emmo/middle/materials#EMMO_4d604a13_d1f6_42fd_818f_d3138d5e308c

Elucidation: A liquid aerosol composed of water droplets in air or another gas.

Preflabel: Vapor

Relations:

- is_a materials.LiquidAerosol

GasSolidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_d4f37e32_16ae_4cc6_b4cd_fd896b2449c4

Elucidation: A coarse dispersion of solid in a gas continuum phase.

Example: Dust, sand storm.

Preflabel: GasSolidSuspension

Relations:

- is_a materials.Gas
- is_a materials.Suspension

Smoke

IRI: http://emmo.info/emmo/middle/materials#EMMO_5a2af26d_99de_4e5e_b1cd_514be71420c3

Elucidation: Smoke is a solid aerosol made of particles emitted when a material undergoes combustion or pyrolysis.

Preflabel: Smoke

Relations:

- is_a materials.SolidAerosol

SolidSolution

IRI: http://emmo.info/emmo/middle/materials#EMMO_5e77f00d_5c0a_44e7_baf1_2c2a4cb5b3ae

Elucidation: A solid solution made of two or more component substances.

Preflabel: SolidSolution

Relations:

- is_a materials.Solution
- is_a materials.Solid

LiquidAerosol

IRI: http://emmo.info/emmo/middle/materials#EMMO_94010cbc_c2a6_4cb9_b29a_83aa99d2ff70

Elucidation: An aerosol composed of liquid droplets in air or another gas.

Preflabel: LiquidAerosol

Relations:

- is_a materials.Aerosol

GasMixture

IRI: http://emmo.info/emmo/middle/materials#EMMO_5be9c137_325a_43d8_b7cd_ea93e7721c2d

Elucidation: A gaseous solution made of more than one component type.

Preflabel: GasMixture

Relations:

- is_a materials.Gas
- is_a materials.Solution

Suspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_4a464c8d_8895_44a8_a628_aed13509f1bd

Elucidation: An heterogeneous mixture that contains coarsly dispersed particles (no Tyndall effect), that generally tend to separate in time to the dispersion medium phase.

Preflabel: Suspension

Relations:

- is_a materials.Dispersion
- is_a materials.PhaseHeterogeneousMixture
- is_a materials.StateOfMatter

- disjoint_union_of materials.SolidSolidSuspension, materials.SolidLiquidSuspension, materials.LiquidGasSuspension, materials.LiquidLiquidSuspension, materials.SolidGasSuspension, materials.GasSolidSuspension, materials.GasLiquidSuspension, materials.LiquidSolidSuspension

SolidAerosol

IRI: http://emmo.info/emmo/middle/materials#EMMO_96c8d72f_b436_44e2_9f7f_085c24094292

Elucidation: An aerosol composed of fine solid particles in air or another gas.

Preflabel: SolidAerosol

Relations:

- is_a materials.Aerosol

SolidGasSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_c457b6b9_5e73_4853_ae08_d776c12b8058

Elucidation: A coarse dispersion of gas in a solid continuum phase.

Preflabel: SolidGasSuspension

Relations:

- is_a materials.Suspension
- is_a materials.Solid

Aerosol

IRI: http://emmo.info/emmo/middle/materials#EMMO_560d833a_6184_410c_859a_05d982712fd7

Elucidation: A colloid composed of fine solid particles or liquid droplets in air or another gas.

Preflabel: Aerosol

Relations:

- is_a materials.Gas
- is_a materials.Colloid

SolidSolidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_2dd512a1_5187_47cc_b0b8_141214e22b59

Elucidation: A coarse dispersion of solid in a solid continuum phase.

Example: Granite, sand, dried concrete.

Preflabel: SolidSolidSuspension

Relations:

- is_a materials.Suspension
- is_a materials.Solid

Spray

IRI: http://emmo.info/emmo/middle/materials#EMMO_498aad49_f8d4_40a4_a9eb_efd563a0115f

Elucidation: A suspension of liquid droplets dispersed in a gas through an atomization process.

Preflabel: Spray

Relations:

- is_a materials.GasLiquidSuspension

LiquidLiquidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_47fe2379_be21_48d1_9ede_402f0faf494b

Elucidation: A coarse dispersion of liquid in a liquid continuum phase.

Preflabel: LiquidLiquidSuspension

Relations:

- is_a materials.Suspension
- is_a materials.Liquid

Dust

IRI: http://emmo.info/emmo/middle/materials#EMMO_e4281979_2b07_4a43_a772_4903fb3696fe

Elucidation: A suspension of fine particles in the atmosphere.

Preflabel: Dust

Relations:

- is_a materials.GasSolidSuspension

Solid

IRI: http://emmo.info/emmo/middle/materials#EMMO_a2b006f2_bbfd_4dba_bcaa_3fca20cd6be1

Elucidation: A continuum characterized by structural rigidity and resistance to changes of shape or volume, that retains its shape and density when not confined.

Preflabel: Solid

Relations:

- is_a materials.StateOfMatter
- is_a materials.Continuum

LiquidSol

IRI: http://emmo.info/emmo/middle/materials#EMMO_4354ac74_7425_43ab_92e4_6dc19d1afee9

Elucidation: A type of sol in the form of one solid dispersed in liquid.

Preflabel: LiquidSol

Relations:

- is_a materials.Sol
- is_a materials.Liquid

GasLiquidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_e0edfb9e_9a96_4fae_b942_831ffe27b84a

Elucidation: A coarse dispersion of liquid in a gas continuum phase.

Example: Rain, spray.

Preflabel: GasLiquidSuspension

Relations:

- is_a materials.Gas
- is_a materials.Suspension

Plasma

IRI: http://emmo.info/emmo/middle/materials#EMMO_4c21fb86_fdcf_444e_b498_86fe656295af

Elucidation: A fluid in which a gas is ionized to a level where its electrical conductivity allows long-range electric and magnetic fields to dominate its behaviour.

Preflabel: Plasma

Relations:

- is_a materials.Fluid
- is_a materials.StateOfMatter

AcqueousSolution

IRI: http://emmo.info/emmo/middle/materials#EMMO_5cb107ba_7daa_46dd_8f9f_da22a6eac676

Elucidation: A liquid solution in which the solvent is water.

Preflabel: AcqueousSolution

Relations:

- is_a materials.LiquidSolution

LiquidFoam

IRI: http://emmo.info/emmo/middle/materials#EMMO_d69d2e95_b22f_499a_a552_17fde0d778fc

Elucidation: A foam of trapped gas in a liquid.

Preflabel: LiquidFoam

Relations:

- is_a materials.Foam
- is_a materials.Liquid

LiquidGasSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_42185fe7_122c_4e0c_a3cd_659d3e21c389

Elucidation: A coarse dispersion of gas in a liquid continuum phase.

Example: Sparkling water

Preflabel: LiquidGasSuspension

Relations:

- is_a materials.Suspension
- is_a materials.Liquid

SolidFoam

IRI: http://emmo.info/emmo/middle/materials#EMMO_9bed5d66_805a_4b3a_9153_beaf67143848

Elucidation: A foam of trapped gas in a solid.

Example: Aerogel

Preflabel: SolidFoam

Relations:

- is_a materials.Foam
- is_a materials.Solid

SolidSol

IRI: http://emmo.info/emmo/middle/materials#EMMO_5add9885_dc98_4fa5_8482_fdf9ba5e3889

Elucidation: A type of sol in the form of one solid dispersed in another continuous solid.

Preflabel: SolidSol

Relations:

- is_a materials.Sol
- is_a materials.Solid

Emulsion

IRI: http://emmo.info/emmo/middle/materials#EMMO_40e18c93_a1b5_49ff_b06a_d9d932d1fb65

Elucidation: An emulsion is a mixture of two or more liquids that are normally immiscible (a liquid-liquid heterogeneous mixture).

Example: Mayonnaise, milk.

Preflabel: Emulsion

Relations:

- is_a materials.Colloid
- is_a materials.Liquid

Liquid

IRI: http://emmo.info/emmo/middle/materials#EMMO_7509da43_56b1_4d7f_887a_65d1663df4ba

Elucidation: A liquid is a nearly incompressible fluid that conforms to the shape of its container but retains a (nearly) constant volume independent of pressure.

Preflabel: Liquid

Relations:

- is_a materials.Fluid
- is_a materials.StateOfMatter

Gel

IRI: http://emmo.info/emmo/middle/materials#EMMO_3995e22d_5720_4dcf_ba3b_d0ce03f514c6

Elucidation: A soft, solid or solid-like colloid consisting of two or more components, one of which is a liquid, present in substantial quantity.

Preflabel: Gel

Relations:

- is_a materials.Colloid
- is_a materials.Solid

LiquidSolution

IRI: http://emmo.info/emmo/middle/materials#EMMO_4b3e2374_52a1_4420_8e3f_3ae6b9bf7dff

Elucidation: A liquid solution made of two or more component substances.

Preflabel: LiquidSolution

Relations:

- is_a materials.Solution
- is_a materials.Liquid

SolidLiquidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_33e0ac8b_a318_4285_b1de_e95347784632

Elucidation: A coarse dispersion of liquid in a solid continuum phase.

Preflabel: SolidLiquidSuspension

Relations:

- is_a materials.Suspension
- is_a materials.Solid

Gas

IRI: http://emmo.info/emmo/middle/materials#EMMO_04f2a2d5_e799_4692_a654_420e76f5acc1

Elucidation: Gas is a compressible fluid, a state of matter that has no fixed shape and no fixed volume.

Preflabel: Gas

Relations:

- is_a materials.Fluid
- is_a materials.StateOfMatter

LiquidSolidSuspension

IRI: http://emmo.info/emmo/middle/materials#EMMO_e9e02156_651f_41c8_9efb_d5da0d4ce5e2

Elucidation: A coarse dispersion of solids in a liquid continuum phase.

Example: Mud

Preflabel: LiquidSolidSuspension

Relations:

- is_a materials.Suspension
- is_a materials.Liquid

Chapter 4

Individuals

Universe

IRI: http://emmo.info/emmo/top/mereotopology#EMMO_08cb807c_e626_447b_863f_e2835540e918

Preflabel: Universe

Relations:

- is_a physical.Physical

Chapter 5

Appendix

The complete taxonomy of EMMO relations

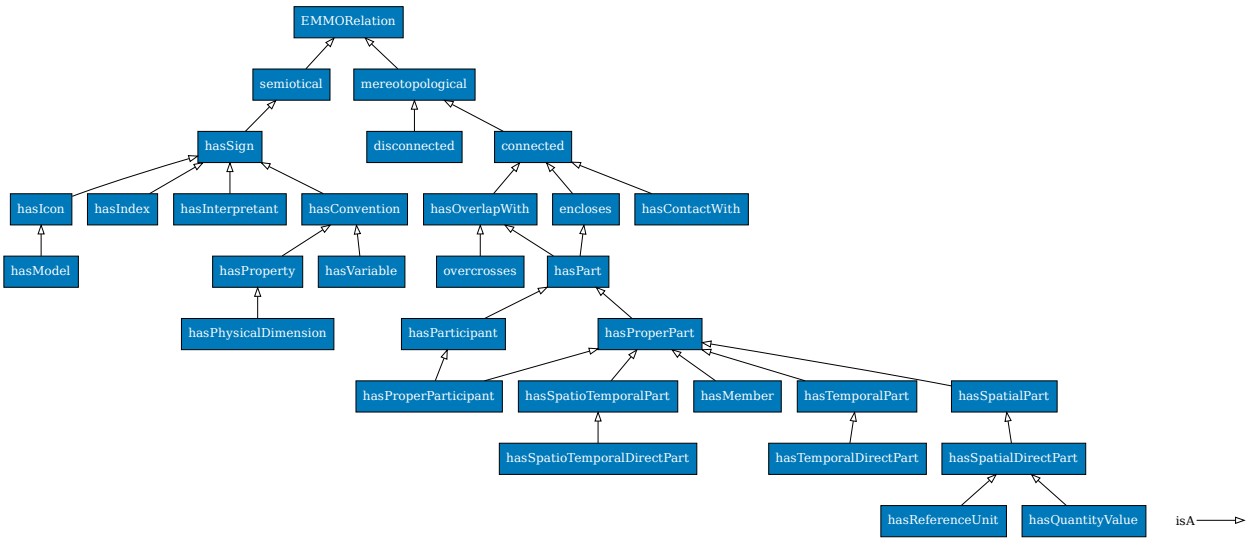


Figure 5.1: The complete taxonomy of EMMO relations.

The taxonomy of EMMO classes

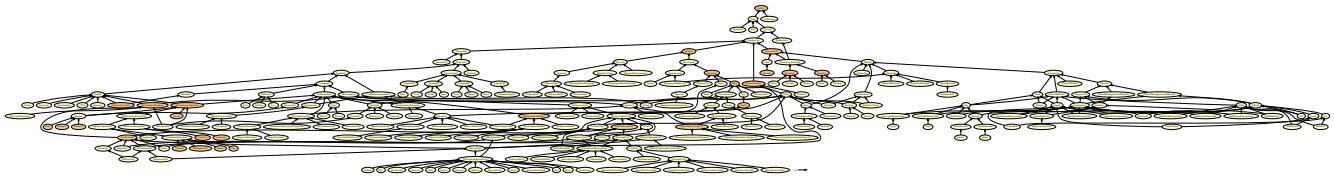


Figure 5.2: The almost complete taxonomy of EMMO classes. Only physical quantities and constants are left out.