Dear All,
Here my attempt to reduce the confusion about STVs

Comments welcome!

Martin

**OLD:**

**E92 Spacetime Volume**

 Subclass of: E1 CRM Entity

Superclass of: E4 Period

 E18 Physical Thing

E93 Presence

 Scope note: This class comprises 4 dimensional point sets (volumes) in physical spacetime regardless its true geometric form. They may derive their identity from being the extent of a material phenomenon or from being the interpretation of an expression defining an extent in spacetime. Intersections of instances of E92 Spacetime Volume, Place and Timespan are also regarded as instances of E92 Spacetime Volume. An instance of E92 Spacetime Volume is either contiguous or composed of a finite number of contiguous subsets. Its boundaries may be fuzzy due to the properties of the phenomena it derives from or due to the limited precision up to which defining expression can be identified with a real extent in spacetime. The duration of existence of an instance of a spacetime volume is trivially its projection on time.

Examples:

      the spacetime Volume of the Event of Caesar’s murder

      the spacetime Volume where and when the carbon 14 dating of the "Schoeninger Speer II" in 1996 took place

      the spatio-temporal trajectory of the H.M.S. Victory from its building to its actual location

      the spacetime volume defined by a polygon approximating the Danube river flood in Austria between 6th and 9th of August 2002

In First Order Logic:

 E92(x) ⊃ E1(x)

Properties:

P10 falls within (contains): E92 Spacetime Volume

P132 spatiotemporally overlaps with: E92 Spacetime Volume

P133 spatiotemporally separated from: E92 Spacetime Volume

P160 has temporal projection: E52 Time-Span

P161 has spatial projection: E53 Place

**NEW**

**E92 Spacetime Volume**

Subclass of: E1 CRM Entity

Superclass of: E4 Period

 E18 Physical Thing

E93 Presence

Scope note: This class comprises sets of 4 dimensional points forming contiguous volumes in physical spacetime, as understood in physics. They may derive their identity from being the extent of a material phenomenon or from being the application of a geometric expression defining an extent in spacetime. Intersections of instances of E92 Spacetime Volume, Place and Timespan are also regarded as instances of E92 Spacetime Volume. An instance of E92 Spacetime Volume is either contiguous or composed of a finite number of contiguous subsets. Its boundaries may be fuzzy due to the properties of the phenomena it derives from or due to the limited precision up to which defining expression can be identified with a real extent in spacetime. The duration of existence of an instance of a spacetime volume is trivially its projection on time.

 Volumes in spacetime are not easy to be imagined and most users of the CRM may not be concerned with them, using only indirectly E92 Spacetime Volume via its phenomenal subclasses, such as E4 Period. E92 Spacetime Volume should not directly be instantiated to describe such items having a phenomenal identity. Nevertheless, the class forms part of the logical foundations of the CRM and is basic for the logic of reconstructions of stages of buildings, things contained in mobile things and others. It is a fundamental construct to describe and reason about topological and chronological relationships and forms the primary logical connection of the CRM to the standards of the georeferencing communities[[1]](#footnote-1)[1]. E92 Spacetime Volume may directly be instantiated to describe approximations of the confinement of phenomenal items using the property *P169 defines spacetime volume (spacetime volume is defined by),* typically by defining extents in space being constant for some time-span. Such approximations must not be confused with the actual extent and identity of the respective items. In the definition of spacetime volumes for confining things happening on Earth, the altitudinal extent is normally omitted.

The best intuition about a point in spacetime is like the “when and where” of a microscopic event. It can be referred to by combinations of space and time coordinates, such as (37°58'17.14"N, 23°43'35.72"E, 156.5m a.s.l., 26/9/1687 12:00), but seen under different reference systems of space and time the values to refer to the *same point* will differ. The point itself nor a volume of such points are relative to any reference system. A good intuition about a volume in spacetime is that of a temporary extent in space, possibly moving and changing, such as the inner of a soap bubble or of an airplane, or the water-filled volume of a technical lake over one year.

Examples:

      the spacetime volume defined by a polygon approximating the Danube river flood in Austria between 6th and 9th of August 2002

      the area ruled and controlled by Qin Shi Huan from 7 May 247 BC to 10 September 210 BC (E4)

      the spacetime volume when and where Caesar’s murder took place from the first stabbing to burning his corpse (E7,E69)

      the spacetime volume when and where the carbon 14 dating of the "Schoeninger Speer II" in 1996 took place (E16)

      the spatio-temporal trajectory of the H.M.S. Victory from its building to its actual location (E18)

In First Order Logic:

 E92(x) ⊃ E1(x)

Properties:

P10 falls within (contains): E92 Spacetime Volume

P132 spatiotemporally overlaps with: E92 Spacetime Volume

P133 spatiotemporally separated from: E92 Spacetime Volume

P160 has temporal projection: E52 Time-Span

P161 has spatial projection: E53 Place

1. [1] Hiebel, OGC… [↑](#footnote-ref-1)