

Space-Time Dimensionality of Plain Physical Observation

Erik Cerven

Abstract

A local Euclidean reference frame, which forms the basis of physical observations, may be defined by reference to some space-like separated frame, in which case a constrained validity of the closure axiom may be implied. For instance, the inverse of the x_1 component of the four-velocity may be Lorenz-transformed to an Euclidean reference frame defined around $\Delta t = 0$ whose spatial extension is limited by c . In this geometry, local observations of radial increments are made perpendicular to an angular velocity in a space-like separated frame. The space-time dimensionality of this system is further investigated. Interesting applications seem to be contracting three dimensions on a cosmological scale to a single axis of observation, and the Bohr atom.