Space and Time Transport Equations and the Operational Interpretations of Lorentz Transformations as their Linear Solutions

The current study produces a system of transport equations that describe the flow of space and time between inertial reference systems. The approach is based on the formulation of Poincare's synchronization process, which Einstein later used in his first approach to deriving the Lorentz transformations. Our synchronization process formulates synchronicity and space isotropy in inertial reference systems and corresponding non-synchronicity and space anisotropy between them. The infinitesimal limit of those conditions leads to the space and time transport equations of which their solutions describe space and time flow or space and time waves between inertial reference systems. As their linear solutions are the Lorentz transformations, those then are interpreted as constant amplitude traveling space and time waves or constant conserved space and time field flows. The current formulation of the synchronization process is two-fold, one historical and one general. In the historical approach, the Einstein constraint is applied in deriving the space and time transport equations. In this historical deja vu, we show that Einstein derived a time transport equation in his 1905 paper and inventively produced its solution, the Lorentz transformation. Thus, the current study interlinks an extension of the current theory of relativity with a critical review of its early literature.