Review of: "Comment on "On the linearity of the generalized Lorentz transformation""

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Verheest's article presents an original proof for the linearity of one-dimensional generalized Lorentz transformations. The author addresses concerns about the central role of the speed of light in relativity theory, arguing that this role is only apparent due to historical and practical reasons. They also provide a few observations regarding fundamental concepts, filling in gaps and enhancing understanding of the enlightening formulation.

Einstein's special theory of relativity is based on two principles: the laws of physics are invariant in all inertial frames of reference and the speed of light in vacuum is the same for all inertial objects. In 1905, only two fundamental interactions were known: gravitational and electromagnetic. Newtonian gravity is described by an action at a distance, while light was known to be an electromagnetic phenomenon with a finite speed. This historic prospect explains why Einstein gave light such a dominant role in his theory.

The tradition of teaching relativity through the light principle continues to this day. Vladimir Ignatowski first derives Lorentz transformations without mentioning the speed of light. Verheest has observed that it is more compelling to derive the Lorentz transformations without mentioning the speed of light at all. He also points out that instantaneous interactions and Newton's absolute time are inextricably related when we assume (i).

Homogeneity of time requires that the ratiodt ′/dt be independent of time, leading to a constant ratio dt ′ = a(v)t+b(v). Combining the former equations leads to a(v) 2 = 1→ a(v) =±1, and conserving the time direction leaves us witht ′ =t.

In terms of linearity, two minor issues arise. The first issue arises when solving the homogeneous linear system, where Verheest assumes a nonzero determinant of the coefficients. In this case, the system reduces to a single equation, but this transformation is inadmissible because it does not have an inverse.

According to these contents, it is a good article and has the ability to be printed.