

Relativity, Dimensionality, and Existence

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Abstract

The main purpose of this paper is to demonstrate that the analysis of the kinematical effects of special relativity holds the key to answering the question of the dimensionality of the world. It is shown that these effects and the experiments which confirmed them would be impossible if the world were three-dimensional. Section 2 shows that relativity of simultaneity, conventionality of simultaneity, and the existence of accelerated observers in special relativity would be impossible if the world were three-dimensional. Section 3 deals with the dimensionality of physical objects and demonstrates that the relativistic length contraction and the twin paradox would be impossible if the physical bodies involved in these relativistic effects were three-dimensional objects.

Keywords: Minkowski, spacetime, dimensionality of the world, relativity and conventionality of simultaneity, length contraction, twin paradox, accelerated observers in special relativity

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