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RELATIVITY THEORY AND THE PRINCIPLE OF RATIONALITY OF MEASUREMENT

Robert J. Buenker

Research Scholar, Department of C-Mathematics and Natural Sciences, University of Wuppertal, Gaussstr. 20, D-42097, Wuppertal, Germany

ABSTRACT

One of the most basic principles in science is the objectivity of measurement of physical properties. According to the special theory of relativity (STR), this ancient principle is violated for observers in relative motion since it predicts that they generally will disagree on the ratios of the lengths of two objects and also on whose clock is running slower at any given time. It is pointed out that neither of these claims of the theory has ever been verified experimentally. On the contrary, one knows from experiments that have been carried out with circumnavigating airplanes that less time is recorded on an accelerated clock than on its identical counterpart whose state of motion has not changed. Moreover, measurements of the transverse Doppler Effect (TDE) have shown that wavelengths increase when light sources are accelerated, which fact is inconsistent with the Fitzgerald-Lorentz contraction effect (FLC), which predicts that the dimensions of a photographic plate co-moving with the light source should decrease by varying amounts depending on its orientation. If one insists on the other hand that the Principle of Rationality of Measurement (PRM) also hold for observers in relative motion, each of the above inconsistencies in relativity theory can be eliminated without coming into conflict with any previously confirmed experimental observations. Finally, it is pointed out that one can achieve a definitive test of the PRM by measuring Doppler-shifted light frequencies from the vantage point of an observer in an accelerated rest frame.

KEYWORDS: *Einstein's Symmetry Principle (ESP), Asymmetric Time Dilation, Clock-Rate Proportionality, Lorentz Transformation (LT), Alternative Global Positioning System-Lorentz Transformation (GPS-LT), Absolute Remote Simultaneity, Isotropic Length Expansion, Uniform Scaling of Physical Properties, Amended Version of the Relativity Principle (RP)*

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