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THE LORENTZ TRANSFORMATION AND THE TRANSVERSE DOPPLER EFFECT

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According to the Δy=Δy' equation of the Lorentz transformation (LT) of the special theory of relativity (STR), the value of any distance interval measured on a moving object that is oriented transverse to the velocity of that object should be independent of its relative speed to the observer. It is known from experiments with the transverse Doppler effect, however, that the wavelength of light emitted from a moving source *increases uniformly in all directions* with its speed relative to the observer. When one combines the Δy=Δy' axiom from STR with the above experimental finding, the unavoidable conclusion is that the *in situ* value of the wavelength must also vary with the state of motion of the light source. Otherwise, it is impossible to explain how the laboratory observer could find that the wavelength of the light from the accelerated source changes even when it is measured in a direction which is transverse to its velocity relative to this source. Experimental measurements indicate that this is not the case, however: the *in situ* value of the wavelength of light from a given source is always the same, regardless of the latter's state of motion. The Relativity Principle (RP) on which STR is based also leads to this conclusion. The only way to reconcile theory with experiment under these circumstances is to *reject the Δy=Δy'* claim of STR. Instead, one must assume *that the lengths of objects increase upon acceleration in the same proportion as the rates of clocks slow down*, independent of their orientation to the direction of relative motion to the observer.

BIOGRAPHY

Robert J Buenker was working at Fachbereich C-Mathematik und Naturwissenschaften, Bergische Universität Wuppertal, Gaussstr. 20, D-42097 Wuppertal, Germany. Robert research interest includes Lorentz transformation, astrophysics, and relativity principle. Robert is an honorary author for Journal of Astrophysics and Aerospace Technology. Robert has authored of several research articles like GPS-Compatible Lorentz transformation that satisfies the relativity principle.

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