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The relativistic length transformation: more than a Lorentz contraction

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A well known result of special relativity is that an object, moving with constant speed away from an inertial observer, has its proper length along the direction of observation reduced due to the Lorentz contraction. Although some might describe this effect as the relativistic length transformation, a more appropriate use of this term could apply to how the observed length of the object changes as the observer goes from the original inertial frame to a new one. Therefore the relativistic length transformation might yield an elongation or a contraction, depending on the circumstances. The general result for parallel velocities is derived. Although the result is not entirely new, the concept of the length transformation does not seem to be presented in this way in general texts. As an example of its application, the result is used to substantially simplify the derivation given in a well-known electrodynamics textbook of the relativistic transformation of the electric field, where the physical interpretation of the length transformation is obscured by the mathematics.

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