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Deriving a Longer Time Dilation Formula:

Implications

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Abstract

Using a similar light clock thought experiment, I derived a longer or more general time dilation formula which allows us to compute time dilation at different angles the light pulse is fired. The longer formula is correct since when the angle is 90° , that is, imitating the original light clock experiment, the longer formula is reduced to the original time dilation formula. However, at some angles, the results yield time contraction rather than dilation. Consequently, two synchronous light clocks placed inside a moving ship can respectively indicate, from one frame, a simultaneous dilation and contraction of time. Because of these absurd results, I conclude that the mathematical time dilation measured from the imaginary light clock experiment is trivial and does not allow us to infer an ontological time dilation.

Keywords

special relativity, time dilation, longer formula, “time contraction”, thought experiment