

# Time dilation distorts c in local frames

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*Source:* <http://sci.tech-archive.net/Archive/sci.physics.relativity/2006-04/msg00930.html>

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  - *Date:* 13 Apr 2006 21:48:24 -0700
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According to the theory of relativity, changes to the metre due to motion (length contraction) cannot be observed in the local frame but events are directly affected by time dilation in the local frame. This asymmetry leads to the conclusion that the speed of light is anisotropic.

An object in space is 300000km long and at rest. The local metre is measured as 1 metre, a second as 1 second and c as 300000km/sec.

The object accelerates to 299999km/sec. The local metre is still measured as 1 metre but the local second has now an effective value of only .00258 seconds. To cover the distance of 300000km of the object from end to end, light needs more time, in fact 387.3 of the new seconds as against 1 second at rest. Therefore, the speed of light is reduced to 775km/sec (300000km/387.3sec).

This example makes the assumption that time dilation is immediately and directly applied in the local frame. The same assumption is made by the twin paradox where the moving twin experiences time dilation in his own frame by aging more slowly than his stationary brother. Likewise, cosmic ray muons can outlive themselves because they are subject to time dilation. Here again, time dilation is direct rather than being only observed from another frame and not experienced in the local frame.

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