

Re: Length Contraction Fully Explained

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Tom Roberts wrote (in another thread):

Ultimately it is the DIFFERENCE IN SIMULTANEITY between frames A and B that is the source of the length contraction [kk added emphasis]

<http://tinyurl.com/hvpej> [Roberts to GSS 3-19-06]

The "difference in simultaneity" means the "relativity of simultaneity."

The "relativity of simultaneity" is when observers equidistant from events in various frames see light signals from the events arrive differently.

Therefore, contrary to Tom's latest words, the "relativity of simultaneity" has nothing to do with math or geometry, and everything to do with the relative motions of light and inertial frames.

So Tom is wrong here, just as he was wrong with his example, which follows:

You will search in vain for the answer to "What is the 'physical cause' of a building looking narrower from a corner than from its front?" Your search here is also hopeless.

Everyone but Tom knows that the physical cause of the building looking narrower is simply the different position of the observer in relation to the building, and the same applies to the "relativity of simultaneity," where the physical cause is the different motions of frames relative to the approaching light signals.

Let's look closer at Tom's latest words:

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[kk wrote:]

what we really need to know is
What causes this difference in simultaneity?

["Shruggin' Thomas" wrote:]

The very same geometrical projection. <shrug>

In other words, we need to find the physical cause
of Einstein's relativity of simultaneity.

No, we don't. This is a geometrical relationship,
not a "physical cause". <shrug>

Tom clearly fails to realize that we are talking
physics here, and no math can cause anything to
happen in physics.

The "relativity of simultaneity" happens in physics,
so its cause must be physical.

The given problem was to find the physical cause of
the relativistic "length contraction," and, as I
said, Tom helped get us started by pinning down
the penultimate cause, "relative simultaneity,"
despite his silly protestation that this is
merely math.

To reiterate:

SR is concerned with what happens when inertial
observers use Einstein-set clocks and standard
rulers to time and locate events in space. All
of this is purely physical, and none of it is
in any way controlled by math (or geometry).

Does "Shruggin' Thomas" deny that during the SR
length contraction, Einstein's clocks and rulers
are used?

Does "Shruggin' Thomas" deny that the only way to
obtain the SR length contraction in the real world
is by using Einstein's clocks and rulers?

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This is physics, not math. Math cannot cause anything in physics.

--kk--

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