Answer on Question #68534, Physics / Mechanics | Relativity

If i was travelling towards a light pulse in opposite direction to its velocity wouldnt length contraction and time dilation make its velocity even bigger than c, for my length measuring rods will become shorter so i will measure more distance travelled by the light and my clocks will run slower so more time for light to travel ? I get it when the distance between the pulse and observer is increasing but not the other way.

Solution:

The velocity of the body approaches to the speed of light in vacuum. This is a special relativity.

The speed of the body is always less than the speed of light in vacuum.

Two postulates of special relativity.

First postulate (principle of relativity): The laws of physics are the same in all inertial frames of reference.

Second postulate (invariance of c): The speed of light in free space has the same value *c* in all inertial frames of reference.

Time dilation (different times t and t' at the same position x in same inertial frame):

$t' = \frac{t}{\sqrt{1-\frac{v^2}{c^2}}}$ (1), where v is the speed of body

Length contraction (different positions *x* and *x′* at the same instant *t* in the same inertial frame):

$l' = l_0\sqrt{1-\frac{v^2}{c^2}}$ (2), where v is the speed of body

The laws of classical physics (e.g., $l' = vt'$) are not right for special relativity. In this way, the direction of the motion of body does not matter.