

Conservation of energy and momentum

Suppose a source of energy in a stationary frame applies a force to a small object moving very quickly toward it. The energy supplied equals the force multiplied by the distance through which the force is applied, say 1 metre. SR predicts the length of moving measuring rods will contract and the distance measured in the moving frame will be more, e.g. 1.1m. So it would seem to observers at rest that the measured change in energy in the moving frame will be larger - unless the force is measured as correspondingly smaller.

The change of momentum is the product of the force and the time of its application. But this will seem to be less for the moving object because its clocks run slower - unless the force is measured as correspondingly larger. If energy and momentum are conserved in special relativity, how?