

Length Contraction

Physics

Moving objects are shorter along the direction of motion.

An object's length along its direction of motion is reduced by the Lorentz factor.

$$L = L_0/\gamma$$

Proper length L_0

The longest measurement.

Measured at rest

$v = 0.87c$

$\gamma = 2.$

Half the length

Perpendicular

No change

THE COMMON MISTAKE

✗ **Thinking the object is physically squeezed**

✓ **It is a measurement in that frame**

In the object's own frame nothing has changed. Length is not an absolute property but a frame-dependent measurement.

The muon explanation works from either side: dilated lifetime in our frame, or a contracted atmosphere in the muon's.