

71. The mean lifetime of a pion measured by observers on the Earth is $\Delta t = \gamma \Delta t_0$, so the distance it can travel (using Eq. 38-12) is

$$d = v\Delta t = \gamma v\Delta t_0 = \frac{(0.99)(2.998 \times 10^8 \text{ m/s})(26 \times 10^{-9} \text{ s})}{\sqrt{1 - (0.99)^2}} = 55 \text{ m} .$$