Answer on Question #82595, Physics / Mechanics | Relativity

Question:

A particle is fired with a constant velocity of 10*10^5 m/s into a region where it is subjected to an acceleration of 2*10^12 m/s^2 directed opposite to the initial velocity. how far does the particle travel before coming to rest?

Solution:

The time of movement equals to $\tau = \frac{v}{a} = \frac{10^6}{2 \cdot 10^{12}} = 0.5 \cdot 10^{-6}$ (s), while the displacement $s = v\tau - 0.5a\tau^2 = 0.5a\tau^2 = 10^{12} \cdot 0.25 \cdot 10^{-12} = 0.25$ (m).

The answer:

The displacement s equals to 0.25 m.