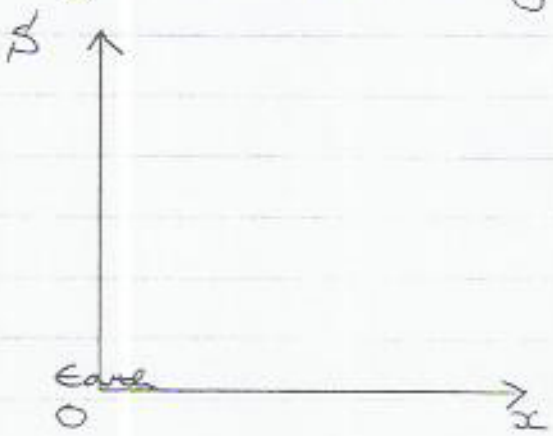
note, m is called the rest-mass of the particle (see p 40)

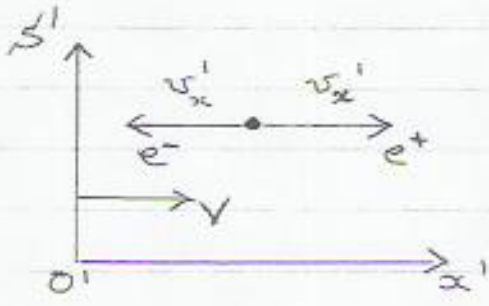
Let us assume subatomic particle is at rest in the S' frame.
Also let us assume Earth is at origin in S frame.

Since sub-atomic particle is approaching Earth, V in our formulae will be negative. ($V = -0.80c$)

9.0×10^8 m above Earth, is value of x measured in S frame.

Now focus on the decay process,





(a) $\Delta m = 2.40 \times 10^{-30} (kg) - 2 \times (9.1 \times 10^{-31}) (kg)$
$= 5.8 \times 10^{-31}$ kg

Now relativistic energy ($E = E_{rk} + mc^2$) is conserved. So the difference in rest-mass energy is converted into the relativistic <u>kinetic</u> of the newly created particles.

(b) Because total relativistic momentum is zero in S' before decay, the relativistic momentum of each of two new particles must be equal &