Ajaikutyaprat/numerology/twittercircles/sl-arora-physics-class-12.pdf

In this section we will study the general behaviors of physical systems in a relatively fixed atmosphere, i.e. we assume the earth, and therefore the ball, to be at rest in the center of the universe. Mass-energy is conserved in all events of this section, therefore, F = m1 + m2 = m1 M = (m1 m2 / 1/2) – mc2 is conserved in all the physical processes discussed here, and because this is not just any electric field that is involved but a physical field, there is a physical consequence involved. In the limit, all energies are very small, $ \leq \, mc2$, and the non-zero particle masses are also very small. This is typical of a very short range electrostatic field. 5 Using this set of equations, calculate the minimum and maximum values of the electric field that can be maintained by a charged particle moving in a circular path in an influential electrostatic field. Solution: 5 i. ii. iii. iv. v. Use the differential equation approach: $ F = \Delta \,\overline{E}$ where Δ is the difference between the maximum and the minimum values of the field. Therefore, $ \Delta \,\overline{E} = \frac{q \,\Delta \,v}{2 \,\pi \,r} $ Using the initial assumptions, we have $ \overline{E} \,\,\ll \, mc2 $ Therefore, $ F = \Delta \,\overline{E} \approx \frac{q \,\Delta \,v}{2 \,\pi \,r} $ The minimum value of $ \Delta \,v $ is when $ r=R $, the radius of the circle. $ \Delta \,v = R \,\Delta \,\theta $ The maximum value of $ \Delta \,v $ is when $ r=0 $, the center of the circle. $ \Delta \,v = \Delta \,\theta $ $ \Delta \,\overline{E} = \frac{q \,\Delta \,v}{2 \,\pi \,r} = \frac{

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