

## Practice Problems Related to Synchrotron Radiation

Equation (1) in the notes was used to conclude that the total speed is constant, but in reality synchrotron radiation itself will reduce the speed of the charge with time.

1. What is missing in equation (1), which suggests constant speed?
2. What is the criterion for equation (1) to be *almost* right, in the sense that corrections are small? Here we're looking for two time scales to compare, so that if one time scale is much larger than the other, the corrections are small.
3. Derive a criterion on the Lorentz factor  $\gamma$ , possibly involving other quantities, such that equation (1) is almost correct.