

Practice Problems Related to Bremsstrahlung

Suppose that an electron has an initial speed v and an impact parameter b with respect to a nucleus of charge Ze that we will assume remains stationary. The electron starts very far from the nucleus.

1. Write a code to determine the path of the electron as a function of time, and its acceleration (that is, integrate the Lorentz force equation).
2. Use your path to determine $\hat{\mathbf{d}}(\omega)$. Do you find that you reproduce the limits (3) in the notes? For $\omega\tau \gg 1$, how does $\hat{\mathbf{d}}(\omega)$ scale with ω ? Can you obtain this dependence analytically?