

Physics 4261: Homework 3

Prof. Colin V. Parker (cparker@gatech.edu)
Georgia Institute of Technology

3.1. Foot 2.10

3.2. Higher order radiation

A hydrogen atom is in a superposition of the $1s$ ground state and the $4f_{xyz}$ configuration, $\psi_2 = R_{4,3}(r) ((Y_{3,2}(\theta, \phi) - Y_{3,-2}(\theta, \phi)))$. Describe how the charge distribution looks as it evolves in time. What multipoles are present? Add computer plots or drawings. Will the atom emit dipole radiation? If not, what will be the type of radiation emitted?

3.3. Foot 2.12

3.4. Foot 2.13