Notes about course:

- There is a web page for this course, which should be referred to for the most up-to-date information. The URL: http://www.hep.caltech.edu/~fcp/ph125/

- This is the last homework assignment for underclass students. It has been suggested, belatedly, that we not actually have a tenth assignment, for consistency with the seniors and graduate students. We'll discuss this in the last class, on June 2, and decide then.

PROBLEMS:


37. Do exercise 7 of the “Density Matrix Formalism” course note.

38. Electric dipole selection rules: In problem 28 we investigated the life time of a hydrogen level under the long wavelength “electric dipole” approximation. It is conceivable the the result of such a computation could be zero, in some cases, that is, the transition is forbidden in this approximation (but perhaps allowed in higher orders in the expansion of the $e^{ik \cdot x}$ expansion). Consider transitions between states of specified initial and final orbital angular momentum, $\ell_i$ and $\ell_f$, and initial and final projections of the orbital angular momentum on the $z$-axis, $m_i$ and $m_f$. In the electric dipole approximation, what transitions are permitted (e.g., what are the permitted values of $\ell_f$ and $m_f$ if $\ell_i$ and $m_i$ are given)?