

Quantum Mechanics 3, Spring 2012 CMI

Problem set 1

Due by beginning of class on Monday Jan 9, 2012

Time dependent perturbation theory, lifetimes

1. $\langle 15 \rangle$ Find the approximate lifetime of the $|210\rangle$ state of the hydrogen atom. Express the answer in nanoseconds.
2. $\langle 5 \rangle$ The spread in the measurements of the mass of an unstable strongly interacting particle, the Δ baryon is about $120 \text{ MeV}/c^2$. Give an estimate for a lower bound on its life-time.