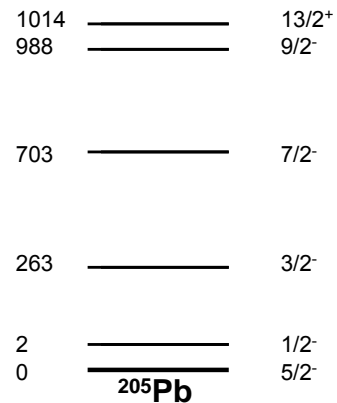


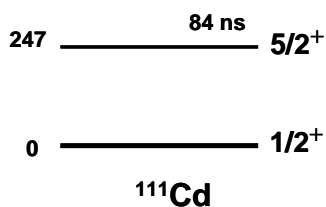
1) Electromagnetic transitions

a) Which electromagnetic transitions are possible and expected within the shown level scheme (not sketched to scale, simplified) for the lead isotope ^{205}Pb (energies in keV)? Estimate (very roughly) the lifetimes and branching ratio (where applicable) using the plot of „single-particle transitions“ given in the script of 12.1.10.



Which is the longest-lived state?

b) The half-life of the transition $5/2^+ \rightarrow 1/2^+$ in ^{111}Cd with a transition energy of 245 keV is 84 ns, the one of the $2^+ \rightarrow 0^+$ transition (transition energy 103 keV) in ^{180}W is 1.2 ns. Compare the values with estimates as obtained from the plot of half-lives (cf. part a).



2) Shell model states

Which states do you expect by simple coupling for ^{211}At (astatine, 3 protons beyond ^{208}Pb) within the shell model? (Do not forget the Pauli principle?)