Lifetime measurements of the 2+ state in ^{128}Nd and ^{132}Sm

Jacob Heery[1]
[1]University of Surrey, UK

The neutron-deficient neodymium and samarium isotopic chains present a good laboratory for studying the onset of nuclear deformation due to the progression from spherical nuclei (^{142}Nd/^{144}Sm) to axially quadrupole deformed as neutrons are removed from the 0h11/2 shell. Energy level systematics suggest that ^{128}Nd and ^{132}Sm are some of the best examples of rigid rotors in the nuclear chart, as both protons and neutrons occupy the mid-shell region. Even accounting for this doubly mid-shell nature, however, there is a sudden enhancement in the B(E2; $2_1+ \rightarrow 0_1+$) values, thought to occur due to the quasi-SU(3) interaction between the 1f7/2 and 0h11/2 $\Delta J = 2$ partner orbitals. Preliminary results will be presented from a recent experiment measuring the lifetime of the 2_1+ state in ^{128}Nd and ^{132}Sm using the charge plunger method (CPM). The CPM is a technique that allows for sub-ns lifetime measurements in cases where the conventional recoil-distance Doppler shift (RDDS) method is unfavourable due to large internal conversion coefficients for transitions depopulating the state of interest.