Lifetime measurements around ^{86}Mo with GRETINA and the S800 spectrometer at NSCL*

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Proton-rich nuclei near the $N = Z$ line present peculiar nuclear structure properties. In fact, proton-neutron correlation properties can be studied when protons and neutrons occupy the same valence orbital. Furthermore, the competition between prolate and oblate shape in nuclei with $N \simeq Z$ in the mass-80 region is still poorly understood, as it is hard to reach with the currently available facilities. Investigating nuclei in this region provides the possibility of studying the effect of the population of the $g_{9/2}$ and $d_{5/2}$ shells in the nuclear structure. An important information to understand the deformation of a nucleus are its reduced transition probability between excited states $B(E\lambda; J_i \rightarrow J_f)$ that can be deduced in a model independent way measuring the lifetimes of those excited states.

Part of the results of a multinucleon knockout experiment performed at the National Superconducting Cyclotron Laboratory (NSCL) are presented. Lifetimes have been measured with the Recoil Distance Doppler Shift method [1]. A radioactive cocktail beam produced by fragmentation of a primary ^{92}Mo beam and a ^{9}Be target were used. Different incoming channels were identified with the A1900 fragment separator, while the different reaction channels were separated by the S800 spectrometer [2]. The γ spectra were obtained with the GRETINA spectrometer [3], allowing one of the best γ-ray energy resolution achievable nowadays. The results have been compared to Geant4 simulations to estimate lifetimes.

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