



Contribution ID: 201

Type: Oral

Lifetime measurements in Rb isotopes around the N=50 shell closure

Monday, 31 August 2015 18:00 (15 minutes)

The half-lives of yrast states in $^{86,87}\text{Rb}$ isotopes, produced in $^{82}\text{Se}(^7\text{Li}, \text{xn})$ reactions, were measured using the ROSPHERE gamma spectrometer. The experimental evidences prior to this measurements lead to the conclusion that $1p\text{-}2h$ proton configurations which involve the $g_{9/2}$, $f_{5/2}$, $p_{3/2}$ orbitals are energetically favored to appear in this mass region with $N \sim 50$ for states at excitation energies lower than ~ 4 MeV. At higher excitation energies, the neutron core breaks and neutron $p\text{-}h$ excitations have to be considered. The proton hole $f_{5/2}p_{3/2}$ orbitals are responsible for delayed gamma decay of these states in neighboring Kr isotopes, having lifetimes in the nanosecond region. It is expected that this configuration to determine the existence of an isomeric state in ^{87}Rb . Also, the experimental evidence concerning the spins and parities for these states located at a medium excitation energy in ^{87}Rb is rather scarce. Of interest in the present work was to investigate the structure of excited states in the Rb isotopes, using the in-beam fast timing technique. From this measurements, the gamma decay multipole could be deduced.

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Session Classification: Nuclear Structure, Spectroscopy, and Dynamics II