P5-28

HIGH SPIN STATE STUDY IN ^{163}LU

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High spin states in ^{163}Lu have been populated in the ^{148}Sm(^{19}F,4n)^{163}Lu reaction with F beam provided by HI-13 tandem of IAE. A tentative level scheme is constructed from the gamma-gamma coincidence experiment with three HpGe-BGO Compton suppressed spectrometers and two bare HpGe detectors. A strong coupling band and a decoupling band have been established.

This investigation is one in a series of high spin state studies of odd-Z even-N rare earth nuclei in order to establish the systematics of the consfiguration-dependent band crossing frequencies based on the alignment of a pair of $i_{13/2}$ quasineutrons. It has been observed[1-5] that the band crossing occurs at larger rotational frequencies for 1/2[541] proton configuration than for the other configurations in odd-Z even-N rare earth nuclei, such as ^{165}Lu, ^{169}Ta, ^{171}Ta, ^{175}Ta and ^{177}Re. This phenomena is interpreted as shape change due to -driving. In order to verify this conclusion ^{163}Lu has been chosen as a good candidate. It has 92 neutrons and it's neutron Fermi level, λ_n, is close to the high-j low-Ω neutron configrations. So that the $(\epsilon_\nu - \lambda_n)$ term in the expression for the quasineutron energy

$$E_\nu = \sqrt{\Delta_n^2 + (\epsilon_\nu - \lambda_n)^2}$$

is smaller in comparision with In this case the quasineutron energy E_ν should not be so sensitive to the ϵ_2 -driving effect. So, the band crossing frequency for 1/2[541] proton configuration in Lu should not be delayed than for the other configurations. Our preliminary result seems to support this conclusion.

References

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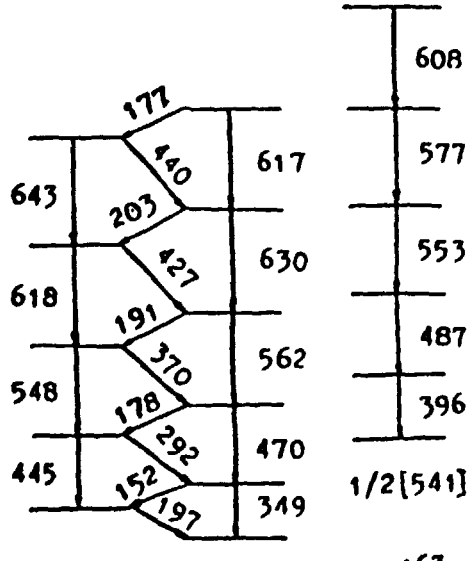

Partial level scheme of ^{163}Lu