Radiative Strength Functions in ^{172}Yb Below 8 MeV

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Self-assessment report

We have measured prompt γ rays after thermal and resonant neutron capture in ^{171}Yb. The γ rays were measured with three high resolution ($\sim$3 keV) and high efficiency (two $\sim$80% Ge(HP) and one $\sim$200% segmented Clover) detectors. We have obtained singles and two-fold coincidence spectra as function of neutron energy using the time-of-flight technique. Two-fold coincidences where the summed energy adds up to the neutron binding energy B_n or to B_n minus the energy of the first excited stated ($\sim$79 keV) will be used to determine the multipolarity of the pygmy resonance in ^{172}Yb. This pygmy resonance is a resonant structure in the radiative strength function around $\sim$3 MeV in deformed rare earth nuclei [1].

The following goals were met:

- We have shown the feasibility of prompt, high-resolution γ spectroscopy at FP14 after thermal as well as resonant neutron capture.

- Online analysis shows that sufficient statistics ($\sim$7000 counts) are expected in each of the two relevant peaks in the summed-energy spectrum.

Analysis of the experiment is in progress. It still remains to show that the multipolarity of the pygmy resonance can be determined experimentally from two-step cascade intensities.

[1] A. Voinov, M. Guttormsen, E. Melby, J. Rekstad, A. Schiller, and S. Siem, Phys. Rev. C **63**, 044313 (2001).