

LOW-ENERGY DIPOLE MODES OF OXYGEN 20, 22, AND 24

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Neutron-rich nuclei are predicted to have exotic low-energy dipole modes due to their lower neutron separation energy or excess neutrons. In order to study the nature of such dipole modes in neutron-rich isotopes, we have performed an experiment at RIKEN Radioactive Isotope Beam Factory. Three oxygen isotope beams, ²⁰O, ²²O and ²⁴O were produced via projectile fragmentation of a ⁴⁸Ca beam. Two different targets, i.e. Au for coulomb excitation and liquid helium for inelastic α particle scattering, were used to compare the difference of excited states. The experimental setup was dedicated to measure γ rays from the decay of excited modes. Large volume LaBr crystals from INFN Milano [1] in combination with high-granularity NaI crystals from RIKEN [2] were used to detect γ rays. The dynamic range of these γ ray detectors were set broad enough to measure direct decay γ rays above neutron threshold energy, in order to investigate exotic low-energy dipole modes around neutron threshold region.

In this session preliminary results of the γ ray spectra will be presented, and possible exotic low-energy dipole modes, not only below neutron threshold, but also above neutron threshold, will be discussed.

REFERENCES

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[2] S. Takeuchi et al., Nucl. Instrum. Methods Phys. Res., Sec. A 763 (2014) 596.