
INVESTIGATION OF THE OCTUPOLE CORRELATION OF NEUTRON-RICH $Z \sim 56$ ISOTOPES BY β - γ SPECTROSCOPY

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A recent study on the static octupole deformation in Ra isotopes [1] has attracted much attention. The interaction between orbits with $\Delta J = \Delta I = 3$ is responsible for strong octupole correlations and thus the nuclei with Z or $N = 34, 56, 88$, and 134 are expected to have large octupole collectivities. Observation of enhanced E1 transition rates is one of the indication of such octupole correlation. Therefore, ^{144}Ba ($Z = 56, N = 88$) will show larger E1 rates than the neighboring nuclides. However, Ref. [2] revealed that ^{148}Ba seems to have large E1 rates as much as those of ^{144}Ba , while ^{146}Ba has much smaller rates. Experimental investigation on the further neutron-rich Ba isotopes will have significant importance to understand this discrepancy.

We have performed a β - γ spectroscopy on neutron-rich isotopes at RIKEN RIBF using in-flight fission of a $345\text{MeV/u } ^{238}\text{U}$ beam. Fission fragments were identified by measuring the time-of-flight and magnetic rigidity in the second stage of BigRIPS and by measuring the energy loss by using the ion chamber at the final focal plane F11. The secondary beam was implanted into an active stopper WAS3ABi [3] and the γ rays were measured by the Ge cluster array, EURICA [4]. After the β -decay analysis of ^{150}Cs , γ rays decaying from the excited levels in ^{150}Ba were identified for the first time. One of the newly found levels in ^{150}Ba is a candidate for the negative-parity state associated with the 3^- octupole band from the systematics of excited levels in even-even Ba isotopes. The excitation energy and decay pattern of the negative parity state observed in ^{150}Ba are consistent with that of 3^- states in neighboring Ba isotopes. The latest results of neutron-rich Ba isotopes including ^{150}Ba will be presented.

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