Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

Observation of new K isomers among neutron-rich rare earth nuclei produced by in-flight fission of 345 MeV/nucleon ^{238}U DAISUKE KAMEDA, TOSHIYUKI KUBO, RIKEN Nishina Center, THE BIGRIPS NEW ISOTOPE COLLABORATION — We have performed search for new K isomers for a wide range of neutron-rich rare earth nuclei using the BigRIPS separator at RIKEN RIBF. The rare earth nuclei were produced by in-flight fission of a ^{238}U beam at 345 MeV/nucleon, and isomeric gamma rays were detected using four clover-type germanium detectors. As a result, we have observed a total of 25 new microsecond isomers: ^{158m,159m,160m}Nd, ^{158m,159m,161m}Pm, ^{160m,161m,162m}Sm, ^{163m,164m}Eu, ^{162m,164m,165m,166m}Gd, ^{164m,165m,166m,167m,168m}Tb, ^{167m,168m,169m,170m}Dy, and ^{171m}Ho, and obtained a wealth of spectroscopic information on these nuclei. The nuclei in this region are predicted to be well deformed with a prolate shape, and Kisomers are expected to appear due to the K hindrance. In the present measurement, as anticipated, many of the observed new isomers have been interpreted as a K isomer, because we could identify some gamma rays which belong to the grand-state rotational band being fed by isomeric transitions. The systematics of known K isomers, such as those in neighboring higher-Zisotones, also help and support the interpretation of isomerism. Here we will report on the details of the experimental results and discuss the possible configurations of deformed orbits for the observed new K isomers.

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Date submitted: 01 Jul 2014 Electronic form version 1.4