Decay spectroscopy of very neutron-rich nuclei at RIBF

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β-decay spectroscopy is a powerful method of shedding light on the evolution of nuclear structure toward extreme neutron-to-proton ratios. Obtaining the decay properties of neutron-rich nuclei is also essential in understanding the mechanism of a rapid-neutron-capture process (r process) nucleosynthesis, which is responsible for the production of elements heavier than iron in the universe.

Recently, the Radioactive Isotope Beam Factory (RIBF) at RIKEN Nishina Center starts providing very exotic nuclei by means of the fragmentation or in-flight fission method of high-intensity beam [1]. Bringing together the world's largest γ-rays detectors (Euroball germanium cluster detectors) [2], a new project EURICA (EUROBALL RIKEN Cluster Array) has been launched with the goal of performing $\beta\gamma$ spectroscopy of exotic nuclei [3]. A campaign experiment of neutron-rich nuclei with EURICA was conducted successfully using 6-12 pnA of an ^{238}U-beam in November-December, 2012. The β- and γ-decay properties of neutron-rich nuclei, such as β-decay half-lives, β-delayed γ, and isomers, have been measured in the vicinity of ^{78}Ni and ^{128}Pd along the r-process path. This paper summarizes the experimental high-lights of beta-decay study and future perspectives at RIBF.

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