

独立行政法人理化学研究所 仁科加速器研究センター 第144回RIBF核物理セミナー RIKEN Nishina Center for Accelerator Based Science The 144th RIBF Nuclear Physics Seminar

Beta Decay Measurements of Neutron-Rich Nuclei at the HRIBF

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Accurate measurements of beta decays are important for many reasons, including understanding nuclei abundances in the cosmos, understanding nuclear structure away from stability, and improved understanding of the decay heat of fission products. Several new detectors have been recently commissioned at the Holifield Radioactive Ion Research Facility (HRIBF) at Oak Ridge National Lab (ORNL). These include the Modular Total Absorption Spectrometer (MTAS), the Versatile Array for Neutron Detection at Low Energies (VANDLE), and the ³He Neutron Detector (3Hen). MTAS is a ton of NaI(TI) and was constructed as a high efficiency gamma detector in order to collect all the gamma and beta radiation following the beta decays of fission products. VANDLE is a time of flight neutron spectrometer. 3Hen is a high efficiency neutron detector. First results from a series of MTAS experiments include gamma intensity measurements of 20 nuclei including 7 priority 1 nuclei from the Assessment of Fission Product Decay Data for Decay Heat Calculations made by Nuclear Energy Agency of IAEA. First results from VANDLE include detailed energy measurements of beta-neutron decays of 29 nuclei. The 3Hen detector, using a laser ion source to create a pure beam of ⁸⁶Ga, has measured the beta-neutron decay from this very exotic nuclei. In addition to measuring the previously unmeasured half-life of ⁸⁶Ga, preliminary analysis shows evidence for the observation of beta decays followed by neutron and gamma transitions. I will discuss the performances of MTAS, VANDLE, and 3Hen and present preliminary results from the recent experimental campaigns.

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