

Beta-Delayed Neutron Spectroscopy of Fission Fragments with BEARtrap at Argonne National Laboratory

Dr. Daniel Burdette

Argonne National Laboratory

Beta-delayed neutron emission properties are important to both basic science and applications-driven nuclear physics research. Branching ratios for these decays of neutron-rich nuclei play a role in r-process nucleosynthesis calculations as they are needed to determine final abundance patterns. The energy spectra of beta-delayed neutron precursors are also of interest to the development of advanced fuel cycles for nuclear reactors. As such, a dedicated ion trap and detector array, referred to as the BEtA Recoil-ion trap (BEARtrap), has been built at Argonne National Laboratory to study beta-delayed neutron emission via the recoil-ion technique. The experimental setup is located in CARIBU's low-energy experimental area to study the large number of unmeasured beta-delayed neutron precursors generated by forthcoming nuCARIBU upgrade. An overview of the experimental method, ion trapping, and detector systems as well as the upcoming first science case of the new apparatus will be presented.