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Beta Decay Q value Measurements for Astrophysics BRITTANY ABROMEIT, SEAN LIDDICK, SCOTT SUCHYTA, NICOLE LARSON, MURALI BOLLA, National Superconducting Cyclotron Laboratory and Michigan State University — The rapid neutron process is responsible for the creation of approximately half of the neutron-rich heavy elements above iron. The path of the r-process depends sensitively on the nuclear masses of the isotopes involved. R-process calculations use masses extracted from global theoretical models. To better constrain the r-process path, the beta-decay of neutron-rich nuclei are studied. The beta-decay Q value can be extracted from a measurement of the beta-decay electron energy distribution, providing the relative mass between the parent and daughter isotope. The NSCL has a successful beta-decay spectroscopy station consisting of multiple segmented 1-mm thick silicon detectors. To determine the sensitivity of the system for beta-decay Q value the system was simulated with Geant4 and compared with a measurement of five 1-mm thick silicon detectors and a pure beta emitter, 90Sr. The comparison between the experimental and simulated beta-decay spectrum, as well as the outlook for Q value measurements with the device, will be presented.

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