Scintillator Detector Characterization for $\beta$-Delayed Neutron Emission\(^1\) RACHEL WILLIAMS, Black Hills State University, SCOTT MARLEY, SERGIO LOPEZ, SUDARSAN BALAKRISHNAN, Louisiana State University — Previous methods to study $\beta$-delayed neutron ($\beta$DN) emission have yielded high efficiency or modest energy resolution, but not both. A new method to study $\beta$DN emission utilizes an ion trap to keep the radioactive ions effectively at rest and a series of detectors to measure the time of flight of the recoil ion and other decay radiation. A procedure and mechanism were developed to systematically characterize the position and low-energy response of the $\Delta$E-E scintillator detectors utilized with the ion trap. The mechanism was designed and subsequently used to hold various sources, including $^{113}$Sn and $^{207}$Bi, at a set distance from the face of the $\Delta$E scintillator, and rotate to characterize all areas of the detector.

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