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Characterizing Neutron Diagnostics on the nTOF Line at SUNY Geneseo HANNAH HARRISON, HANNAH SEPPALA, HANNAH VISCA, PRAVEEN WAKWELLA, KURT FLETCHER, STEPHEN PADALINO, SUNY Geneseo, CHAD FORREST, SEAN REGAN, CRAIG SANGSTER, Laboratory for Laser Energetics, University of Rochester — Charged particle beams from SUNY Geneseo's 1.7 MV Tandem Pelletron Accelerator induce nuclear reactions that emit neutrons ranging from 0.5 to 17.9 MeV via ^{2}H(d,n)^{3}He and^{11}B(d,n)^{12}C. This adjustable neutron source can be used to calibrate ICF and HEDP neutron scintillators for ICF diagnostics. However, gamma rays and muons, which are often present during an accelerator-based calibration, are difficult to differentiate from neutron signals in scintillators. To mitigate this problem, a new neutron time-of-flight (nTOF) line has been constructed. The nTOF timing is measured using the associated particle technique. A charged particle produced by the nuclear reaction serves as a start signal, while its associated neutron is the stop signal. Each reaction is analyzed event-by-event to determine whether the scintillator signal was generated by a neutron, gamma or muon. Using this nTOF technique, the neutron response for different scintillation detectors can be determined. Funded in part by a LLE contract through the DOE.

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