

Abstract Submitted
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Multi-Detector Array for Measuring Tertiary Neutron Anisotropies in DT ICF Targets LEE GABLER, STEPHEN PADALINO, DANA POLSIN, MEGAN RUSS, CRAIG SANGSTER, SUSAN THOMAS, STATE UNIVERSITY OF NEW YORK AT GENESEO COLLABORATION, LLE AT UNIVERSITY OF ROCHESTER COLLABORATION

— A nuclear diagnostic is being developed to ascertain if tertiary neutrons are distributed anisotropically during a DT ICF shot at the NIF. The system will use 8 ultra pure carbon disks as detectors. These disks will be strategically placed around the equatorial plane and polar regions of the NIF target chamber. Due to the high neutron activation threshold for carbon only tertiary neutrons will contribute to the $^{12}\text{C}(n,2n)^{11}\text{C}$ reaction. After the shot each disk will be placed between a matched pair of NaI detectors such that the 511 keV gamma rays produced by radioactive ^{11}C can be measured in coincidence. The entire system will consist of eight pairs of detectors. A partial detector array with three NaI detector pairs encased in lead has been constructed at SUNY Geneseo. The optimal detector configuration, which reduced accidental coincidences, minimized background gamma counts and maximized geometric counting efficiency, was determined with this test bench in preparation for the construction of the full array. Funded in part by the DOE.

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