

Abstract Submitted
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Coincidence Efficiency of Sodium Iodide Detectors for Positron Annihilation¹ THOMAS ECKERT, LAUREL VINCETT, MARK YULY, Houghton College, STEPHEN PADALINO, MEGAN RUSS, MOLLIE BIENSTOCK, ANGELA SIMONE, DREW ELLISON, HOLLY DESMITT, SUNY Geneseo, CRAIG SANGSTER, SEAN REGAN, Laboratory for Laser Energetics — One possible diagnostic technique for characterizing inertial confinement fusion reactions uses tertiary neutron activation of ^{12}C via the $^{12}\text{C}(n, 2n)^{11}\text{C}$ reaction. A recent experiment to measure this cross section involved counting the positron annihilation gamma rays from the ^{11}C decay by using sodium iodide detectors in coincidence. To determine the number of ^{11}C decays requires an accurate value for the full-peak coincidence efficiency for the detector system. A new technique has been developed to measure this coincidence efficiency by detecting the positron prior to its annihilation, and vetoing events in which decay gamma rays other than the 511 keV annihilation gamma rays could enter the detectors. Measurements and simulation results for the absolute coincidence total and full-peak efficiencies are presented.

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Mark Yuly
Houghton College

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