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GRH Characterization using 4.4 MeV ^{12}C Gamma-Rays Y. KIM, H.W. HERRMANN, J.R. LANGENBRUNNER, C.S. YOUNG, B.T. BARTON, J.M. MACK, A.M. MCEVOY, S. EVANS, T. SEDILLO, LANL, W. STOEFFL, LLNL, C.J. HORSFIELD, M. RUBERY, AWE, E.K. MILLER, NSTec, E. GRAFIL, CSM, LOS ALAMOS NATIONAL LABORATORY TEAM, LAWRENCE LIVERMORE NATIONAL LABORATORY TEAM, ATOMIC WEAPONS ESTABLISHMENT TEAM, NATIONAL SECURITY TECHNOLOGIES TEAM, COLORADO SCHOOL OF MINES TEAM — The OMEGA Gamma Reaction History (GRH) diagnostic has been characterized using a relatively well-known source of 4.43 MeV gamma rays produced from inelastic scattering of DT-neutrons off of a graphite puck placed near an imploding capsule at the OMEGA laser facility. An independently measured neutron yield, combined with the known ^{12}C density and ^{12}C(n,n'γ)^{12}C cross-section, allows an in-situ calibration of the GRH detection efficiency at 4.43 MeV. GRH data were collected at two different ^{12}C target locations to confirm the published angular distribution of gamma rays and were compared with MCNP modeling predictions. These in-situ calibrations were used to validate the GRH simulation code based on a coupled MCNP/ACCEPT Monte-Carlo method. By combining these results with other absolute calibration methods, we are able to infer a DT branching ratio for gamma to neutron production and to make an accurate plastic ablator areal density measurement.

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