Abstract Submitted
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A New Neutron Time-of-Flight Detector for Fuel Areal-Density Measurements on OMEGA V.YU. GLEBOV, C.J. FORREST, K.L. MARSHALL, A. PRUYNE, M. ROMANOFSKY, T.C. SANGSTER, M.J. SHOUP III, C. STOECKL, Laboratory for Laser Energetics, U. of Rochester — A new neutron time-of-flight (nTOF) detector for fuel areal-density measurements in cryogenic DT implosions on the OMEGA Laser System was designed, manufactured, and tested. The nTOF detector has a cylindrical thin-wall stainless steel 8-in.-diam, 4-in.-thick cavity filled with an oxygenated xylene scintillator. Four gated photomultiplier tubes (PMT's) with different gains are designed to measure primary DT neutrons, down-scattered neutrons, and tertiary neutrons. The nTOF detector is located 13.85 m from the target chamber center in a collimated line of sight. The design details of the nTOF detector, PMT optimization, and test results on OMEGA will be presented. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

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