

Abstract Submitted
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Investigation of neutron-induced background in Magnetic-Recoil-Spectrometer CR-39 data using a DT neutron source and MCNP simulations¹ LUCIO M. MILANESE, JOHAN FRENJE, MARIA GATU JOHNSON, BRANDON LAHMANN, HONG SIO, RICHARD PETRASSO, MIT — The Magnetic Recoil neutron Spectrometers (MRS) installed on the OMEGA laser facility and the National Ignition Facility (NIF) are routinely used to measure neutron yield, areal density and ion temperatures from DT implosions. The observed background in the lower-energy part of MRS spectra is significantly higher than expected from analysis of neutron-induced background data obtained in stand-alone CR-39 experiments at OMEGA. A possible explanation relates to the scattering of neutrons in the MRS housing vessel, which is not accounted for in current modeling. To test experimentally the impact of individual vessel components on the observed background, parts of the MRS housing have been mocked up and CR-39 data have been collected employing a DT neutron source. The experimental results are contrasted to MCNP simulations to improve our understanding of the mechanism behind the enhanced neutron background. The results will be used to correct measured spectra from OMEGA and the NIF to allow detailed analysis of lower energy data.

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