

Abstract Submitted
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Design of a Neutron Temporal Diagnostic for measuring DD or DT burn histories at the NIF¹ B. LAHMANN, J.A. FRENJE, H. SIO, R.D. PETRASSO, MIT, D.K. BRADLEY, S. LE PAPE, A.J. MACKINNON, N. ISUMI, A. MACPHEE, C. ZAYAS, B.K. SPEARS, LLNL, H. HERMANN, LANL, T.J. HILSABECK, J.D. KILKENNY, GA — The DD or DT burn history in Inertial Confinement Fusion (ICF) implosions provides essential information about implosion performance and helps to constrain numerical modeling. The capability of measuring this burn history is thus important for the NIF in its pursuit of ignition. Currently, the Gamma Reaction History (GRH) diagnostic is the only system capable of measuring the burn history for DT implosions with yields greater than $\sim 1e14$. To complement GRH, a new NIF Neutron Temporal Diagnostic (NTD) is being designed for measuring the DD or DT burn history with yields greater than $\sim 1e10$. A traditional scintillator-based design and a pulse-dilation-based design are being considered. Using MCNPX simulations, both designs have been optimized, validated and contrasted for various types of implosions at the NIF.

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Fredrick Seguin
MIT

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