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ICF Gamma-Ray Yield Measurements on the NIF[1] H.W. HERRMANN, Y.H. KIM, N.M. HOFFMAN, LANL, W.S. STOEFFL, P.W. WATTS, A.C. CARPENTER, J.A. CHURCH, J. LIEBMAN, LLNL, E. GRAFIL, CSM — The primary objective of the NIF Gamma Reaction History (GRH) diagnostic is to provide bang time and burn width information in order to constrain implosion simulation parameters such as shell velocity and confinement time. This is accomplished by measuring DT fusion γ-rays with energy-thresholded Gas Cherenkov detectors that convert MeV γ-rays into UV/visible photons for high-bandwidth optical detection. For yield determination, absolute uncertainties associated with the d(t,n)α/d(t,γ)^{5}He branching ratio and detector response are removed by cross-calibrating the GRH signal against independent neutron yield measurements of directly-driven DT exploding pushers with negligible neutron downscatter. The GRH signal can then be used to make Total DTn Yield inferences on indirectly-driven, cryogenically-layered DT implosions which achieve high areal density and hence scatter a significant fraction of DTn out of the 14 MeV primary peak. By comparing the Total DTn Yield from γ-ray measurements with the Primary DTn Yield (13-15 MeV) from neutron measurements, the Total Downscatter Fraction (TDSF) can be inferred. Results of recent measurements will be presented.

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