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Quantitative Measurements of Mix and Trends with Laser Power, Picket, and 4th Shock Rise Times in Cryogenic NIF Implosions[1] T. MA, N. IZUMI, R. TOMMASINI, D.K. BRADLEY, C.J. CERJAN, T. DOEPPNER, M.J. EDWARDS, S.W. HAAN, M.H. KEY, Lawrence Livermore National Laboratory, J.L. KLINE, Los Alamos National Laboratory, A.J. MACKINNON, H.-S. PARK, P.K. PATEL, B.A. REMINGTON, V.A. SMALYUK, P.T. SPRINGER, R.P.J. TOWN, S.V. WEBER, S.H. GLENZER, Lawrence Livermore National Laboratory — Recent cryogenic deuterium-tritium (DT) capsule implosion experiments on the National Ignition Facility (NIF) have explored the effect of variations in laser pulseshape and power on mix of the ablator into the hot spot. Mix, generally due to hydrodynamic instabilities at the ablation front and at the fuel-ablator interface, can result in a reduced yield and ion temperature, and high x-ray brightness from the hot core due to the ablator mixing into the compressed fuel. Trends in the measured mix in the experimental data based on different laser drive power and pulse shapes (strength of the picket, rise time of the fourth pulse, and duration of the fourth pulse peak power) will be presented. A model that has been developed to quantify ablator mix into the hot spot based on absolute measured bremsstrahlung relative to the neutron yield will be discussed in detail.

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