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Alpha-Heating and a Burning Plasma State[1] O.A. HURRICANE, D.A. CALLAHAN, D.T. CASEY, E.L. DEWALD, T.R. DITTRICH, T. DOEPPNER, M.A. BARRIOS GARCIA, S. HAAN, D.E. HINKEL, L.F. BERZAK HOPKINS, O. JONES, A.L. KRITCHER, S. LE PAPE, T. MA, A. MACPHEE, J. MILOVICH, J. MOODY, A. PAK, H.-S. PARK, P.K. PATEL, B.A. REMINGTON, H.F. ROBEY, J. SALMONSON, P.T. SPRINGER, R. TOMMASINI, LLNL — L. R. BENEDETTI, D. BRADLEY, D. FITTINGHOFF, N. IZUMI, S. KHAN, R. TOWN (LLNL) G. GRIM, N. GULER, G. KYRALA, F. MERRILL, C. WILDE, P. VOLEGOV (LANL) High-foot implosions show net fuel gains and significant alpha-heating [Hurricane et al., *Nature*, **506**, (2014)] using a per shot analysis of NIF data with a static reconstruction of the implosion energetics [e.g. Cerjan et al., *PoP*, **20**, (2013)]. Inference of the alpha-heating contribution to the yield is made using a simulation database of DT implosions and the one-to-one correspondence of yield amplification and normalized Lawson criteria [Patel et al., APS-DPP, (2013); Patel et al. this conf.]. A dynamic semi-analytic model for the DT self-heating rate can be constructed that can more directly be used, with data, to determine the degree of bootstrapping occuring in implosions. Here we propose that the suite of high-foot data demonstrate a scaling of fusion yield performance versus energy absorbed that provides an alternate proof of significant alpha-particle self-heating. This analysis shows that recent high-foot implosions are alpha-heating dominated and thus have achieved a 'burning-plasma' state.

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