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3D Simulations of NIF Wetted Foam Experiments to Understand the Transition from 2D to 3D Implosion Behavior BRIAN HAINES, RICHARD OLSON, AUSTIN YI, ALEX ZYLSTRA, ROBERT PETERSON, PAUL BRADLEY, RAHUL SHAH, DOUG WILSON, JOHN KLINE, RAMON LEEPER, STEVE BATHA, Los Alamos National Laboratory — The high convergence ratio (CR) of layered Inertial Confinement Fusion capsule implosions contribute to high performance in 1D simulations yet make them more susceptible to hydrodynamic instabilities, contributing to the development of 3D flows[1]. The wetted foam platform is an approach to hot spot ignition to achieve low-to-moderate convergence ratios in layered implosions on the NIF[2] unobtainable using an ice layer. Detailed high-resolution modeling of these experiments in 2D and 3D, including all known asymmetries, demonstrates that 2D hydrodynamics explain capsule performance at CR 12 but become less suitable as the CR increases. Mechanisms for this behavior and detailed comparisons of simulations to experiments on NIF will be presented. To evaluate the tradeoff between increased instability and improved 1D performance, we present a full-scale wetted foam capsule design[3] with 17<CR<42 and evaluate its sensitivities to asymmetries. Simulations predict that, given currently achievable levels of asymmetry, their effects negate all advantages of increased CR. [1]B. M. Haines et al. Phys. Plasmas 23:072709, 2016 [2]R. E. Olson et al. Phys. Rev. Lett. 117(24):245001, 2016 [3]B. M. Haines et al. Phys. Plasmas, 24:0727

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