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Sensitivity of Ignition Capsule Performance to Hydrogen Equation of State ABE FETTERMAN, STEVE HAAN, MARK HERRMANN, MARTY MARINAK, DAVE MUNRO, JAY SALMONSON, Lawrence Livermore National Laboratory — There has been some disagreement between experiments measuring the shock Hugoniot density for hydrogen [M. D. Knudson, D. L. Hanson, J. E. Bailey, C. A. Hall, C. Deeney, and J. R. Asay, AIP Conf. Proc. 706, 81 (2004); G. W. Collins, P. Celliers, L. B. Da Silva, et al., Phys Plasmas 5, 1864 (1998)]. We did simulations of capsules intended to produce ignition on the National Ignition Facility [J. A. Paisner, J. D. Boyes, S. A. Kumpan, W. H. Lowdermilk, and M. S. Sorem, Laser Focus World 30, 75 (1994)] with several candidate equations of state spanning the range of recent experiments. Changing the equation of state shifts the optimal shock timing somewhat, but primarily affects the sensitivity of the yield to uncertainties in the shock timing. Even with the stiffest candidate equation of state, performance of the capsules is acceptable with somewhat tightened requirements on shock timing and levels.

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