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A base-line model for direct-drive ICF implosions in the xRAGE code[1] E.S. DODD, J.H. SCHMIDT, J.H. COOLEY, Los Alamos National Laboratory — xRAGE is a radiation-hydrodynamics code using a Godunov solver on an Eulerian mesh with an adaptive mesh refinement (AMR) algorithm, and a radiation diffusion algorithm. It has been used to study fluid flow in highly distorted systems, where arbitrary Langrian Eulerian (ALE) methods are not the method of choice, which can include ICF. A version of the code, called CASSIO, uses an implicit Monte Carlo (IMC) method for radiation transport. However, specific physics packages relevant to ICF have not been available in the past, and which include laser propagation, three-temperature plasma physics and non-LTE opacity calculations. As these physics packages become available and undergo testing, a suite of validation problems is being developed to test the code under conditions relevant to ICF. The direct-drive ICF capsules fielded for the High-Z project [2] will be used as the initial suite of validation problems. This presentation will discuss the capsule experiments and the physics used in the modeling, as well as a brief overview of the software framework used to standardize the verification and validation process.

[1] M. Gittings, R. Weaver, M. Clover, et al., Comp. Sci. and Disc., 1 015005 (2008).
[2] E. S. Dodd, J. F. Benage, G. A. Kyrala, et al., Phys. Plasmas, 19 042703 (2012).

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Evan Dodd
Los Alamos National Laboratory

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