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Hot Spot Formation in ICF Ignition Targets D.M. EKLUND, N.B. MEEZAN, J.C. ZIER, L.J. SUTER, Lawrence Livermore National Laboratory — We present an analysis of hot spot formation physics in an indirect-drive, copper-doped beryllium ignition capsule for the National Ignition Facility. The capsule is simulated in 1-D using the radiation-hydrodynamics code HYDRA. We find that the initial density of the DT fuel gas affects the early-time formation of the hot spot. As the fuel gas is compressed, thermal conduction and alpha-particle deposition ablate DT ice into the hot spot. A constant-entropy model of the hot spot fuel provides an upper bound on capsule performance as a function of final hot-spot mass. The amount of ablated DT ice affects the ability of the hot spot to reach the temperature and column density necessary for ignition. We apply our understanding of hot-spot formation to quantify the robustness of fusion capsules. Surprisingly, the capsule yield is fairly insensitive to large changes in hot-spot thermal conductivity. This work was performed under the auspices of the U.S. Department of Energy by the University of California, Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.

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