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High resolution simulations of ignition capsule designs for the National Ignition Facility¹ DANIEL CLARK, STEVEN HAAN, BRUCE HAMMEL, MICHAEL MARINAK, RICHARD TOWN, Lawrence Livermore National Laboratory — Ignition capsule designs for the National Ignition Facility (NIF) continue to evolve in light of improved physical data inputs, improving simulation techniques, and—most recently—experimental data from recent NIF sub-ignition experiments. This talk summarizes a number of recent changes to the cryogenic capsule design and some of our latest techniques in simulating its performance. Foremost, experiments have indicated harder x-ray drive spectra in NIF hohlraums than were predicted and used for previous capsule optimization studies. To accommodate this harder spectrum, the germanium ablator dopant concentration has been re-optimized based on a series of high resolution 2-D simulations resolving Legendre mode numbers as high as two thousand. Second, concern over the possibility of cooperative or nonlinear interaction of isolated defects on the ablator surface has motivated a series of fully 3-D capsule simulations. These simulations can use actual measured shell surfaces as initial conditions and include resolution to mode two hundred or higher.

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