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2D and 3D Simulations of Exploding Pusher Capsules[1] JESSE PINO, ANDREW SMITH, AARON MILES, Lawrence Livermore National Laboratory — A research campaign is underway at the National Ignition Facility (NIF) at LLNL to study rapidly evolving, non-LTE, inertial fusion plasmas. The goal is to field thin-shelled, gas filled "Exploding Pusher" capsules in a Polar Direct Drive (PDD) configuration. Ion temperatures of > 15 keV and electron temperatures of > 5 keV are reached. A small convergence ratio and rapidly ablated shell reduce susceptibility to hydrodynamic instabilities. Using 1D simulations, most favorable configurations were found to be thin SiO_2 or Be shells containing 10 atm of D_2-He^3 in a 2:1 ratio. This poster describes the 2D and 3D ARES Radiation Hydrodynamics simulations of these capsules. 2D simulations are essential because the PDD configuration requires that each of the beams be "repointed" away from their nominal angles. Each beam can also have a separate power profile and focal length. Large ensembles of simulations were run to probe the parameter space and find the optimal pointing resulting in the most spherical implosions. Response surfaces were constructed to ascertain the susceptibility to shot-time fluctuations. We also discuss resolution convergence and present preliminary results of 3D modeling.

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