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1D Optimization of Uniformly Cu Doped Beryllium Ignition Capsules KRISTOPHER YIRAK, DOUGLAS WILSON, ANDREI SIMAKOV, JOHN KLINE, Los Alamos National Laboratory, JAY SALMONSON, JOSE MILOVICH, DANIEL CLARK, DEBBIE CALLAHAN, SCOTT SEPKE, Lawrence Livermore National Laboratory — An ignition capsule can be tuned by iteratively adjusting the laser pulses in 2D radiation hydrodynamic simulations of a capsule and hohlraum. However, a multitude of optimally tuned designs may be necessary to choose among design options, such as peak laser power and energy, dopant concentration, ablator thickness, DT ice thickness, and other parameters. We use a frequency dependent radiation source derived from 2D integrated calculations to explore the levels and timings of the radiation pulses created by four laser pulses across many 1D calculations. The first pulse is fixed at a level sufficient to melt the beryllium. The fourth pulse duration and length are determined by the laser energy and peak power. Pulse levels and timings are adjusted so that all shocks coalesce just inside the DT ice/gas interface (Munro et al., 2001). In addition to varying ablator and ice thickness (e.g. Haan et al., 2005) we have varied the laser energy, peak laser power, and dopant level, seeking designs optimizing several parameters, including yield (with and without alpha deposition), peak no-burn temperature, rho-r, and velocity. This optimization leads us to low dopant concentrations (0.1 to 0.3%) with thick ablators ($\sim$160-190 microns) for further 2D analysis.

Kristopher Yirak
Los Alamos National Laboratory

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