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NIF ignition target requirements, margins, and uncertainties[1]
STEVEN HAAN, JAY SALMONSON, DANIEL CLARK, DEBRA CALLAHAN, BRUCE HAMMEL, LAURANCE SUTER, JOHN EDWARDS, JOHN LINDL, Lawrence Livermore National Laboratory — We describe simulations of NIF ignition targets, concentrating on a point design target that uses 1.3 MJ to drive a hohlraum to 285eV. The point design capsule has 5 layers of varying Cu dopant to minimize RT instability growth. A set of requirements has been developed that describes all aspects of the target, its fabrication and fielding, the laser pulse, and the features of the pre-ignition experiments that are needed to finalize the design. We describe a model that characterizes the margin of the target as a function of the input parameters and uncertainties. The model has been normalized to 1D, 2D, and 3D simulations. It has been used to define and update the point design, to quantify the impact of each requirement, and to ensure that the requirements are optimally defined. The model can be used to project the probability of ignition, as shot-to-shot variations and more globally given systematic errors. There are several backup targets that are being kept active, including other drive temperatures from 270 to 300eV, CH ablators, and high density C ablators. The relative performance, and specific pertinent issues, regarding these targets are described.

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