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Single- and Multidimensional Robustness Studies of the NIF Ignition Point Design K.S. ANDERSON, R. BETTI, P.Y. CHANG, R. NORA, Laboratory for Laser Energetics and FSC, U. of Rochester, D. SHVARTS, NCRN, M. FATENEJAD, U. of Wisconsin — A robustness study of the NIF ignition point-design target is carried out using hydrodynamically equivalent, all-DT direct-drive targets. The direct-drive targets have similar final mass, kinetic energy, implosion velocity, and adiabat of the indirect-drive point design. The direct-drive target has an equivalent one-dimensional ignition-threshold factor [ITF (1-D)] to the indirect-drive point design. A 1-D sensitivity study of ignition is carried out for various hot-spot conditions, gas pressures, and preheat levels. The hot-spot conditions are varied by changing the thermal conductivity. Two-dimensional studies were performed relating the yield over clean (YOC) of a hydro-equivalent THD surrogate target to fusion gain in the DT ignition target. From these studies is found the minimum THD YOC required to demonstrate ignition in the DT campaign. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement Nos. DE-FC02-ER54789 and DE-FC52-08NA28302.

K.S. Anderson
Laboratory for Laser Energetics and FSC, U. of Rochester

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