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Sensitivity Study of 29 1D Parameters for a Beryllium NIF Ignition Capsule JAY SALMONSON, STEVEN HAAN, BRIAN SPEARS, Lawrence Livermore National Laboratory — We report the results of performing 10,000 1D simulations of a National Ignition Facility capsule, each varying 29 design parameters. Starting with a baseline graded doped Beryllium ignition capsule, we vary all of the 29 parameters randomly. Each parameter is varied according to its design specification and some are assumed to vary normally while parameters that can be measured and rejected if outside specifications are modeled as a top hat distribution. We run 10K capsule simulations and then analyze robustness statistics of this dataset. As a whole, the design specifications for these 29 parameters ensure 98 percent of NIF capsules will ignite in 1D. A rather surprising discovery from the analysis of this data is that, for all the modes of variability included in this data set, the capsule yield is well represented as a two variable function of DT fuel entropy and fuel velocity. We outline our efforts to understand and fit this relationship. This work was performed under the auspices of the U.S. Department of Energy by the University of California,Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.

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