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Thermodynamic modeling of uncertainties in NIF ICF implosions due to underlying microphysics models[1] JIM GAFFNEY, PAUL SPRINGER, GILBERT COLLINS, Lawrence Livermore National Laboratory — Design and analysis calculations for ICF implosions rely on a large number of physics models, which are extremely difficult to test in isolation. As a result, models are often run in regimes where physical models contain significant uncertainties. While efforts have been made to design ignition targets that are robust to physics uncertainties, the use of full-scale hydrodynamic simulations limit these studies to sparse, low dimensional grids. More lightweight models, while much simpler, have proven very useful in analyzing and understand experimental ICF data and play an essential role in moving the field forward. We will describe a thermodynamic hot spot model that includes all physical models, along with variations that are consistent with the expected uncertainties, that is fast and lightweight enough to perform studies consisting of a million simulation points or more. We will present results from a large number of calculations and discuss the use of these data in understanding experimental results, with particular emphasis on underlying microphysics models.

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