

Abstract Submitted
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A Computational Study of Re-emission Balls Proposed for the NIF Ignition Symmetry Campaign¹ D.J. MEEKER, P. AMENDT, E. DEWALD, M.J. EDWARDS, J. MILOVICH, L. SUTER, LLNL — Re-emission balls are high-Z spheres used as surrogates for ICF ignition capsules to detect and correct early-time asymmetries of radiation flux at the target. Emission from these balls mimics the incoming flux due to their high albedo, providing a useful symmetry diagnostic. Experiments on Nova by LANL [1] and LLNL used bismuth (Bi) as the surrogate, selected for its high albedo and insensitivity to the fluorescence of the gold hohlraum wall. We are studying the applicability of these capsules to the NIF symmetry campaign as a potential tuning mechanism to achieve the accuracies required for symmetric implosions. We will describe 2-D simulations that predict the emission of the Bi ball as a function of time, frequency, and spatial distribution, as well as quantifying surrogacy of re-emission balls. Using several tuning examples, we will show the resolution expected from this diagnostic. Suggestions for extending this technique to longer times will be discussed as well as describing 3-D effects from diagnostic viewing ports and an opposing hole to eliminate competing wall emission. [1] Delamater, Phys. Rev. E 53, 5240 (1996), Magelssen, Phys. Rev. E 57, 4663 (1998)

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