Abstract Submitted
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Toward Optimizing Cryogenic Inertial Confinement Fusion Implosions[1] AARNE LEES, RICCARDO BETTI, VARCHAS GOPALASWAMY, DHRUMIR PATEL, JAMES KNAUER, Laboratory for Laser Energetics, U. of Rochester — Current radiation-hydrodynamics codes do not have enough predictive capability to be used for optimizing experimental implosion designs. Furthermore, 2-D or 3-D codes are prohibitively computationally expensive for this application. With recent advances in the statistical mapping of 1-D simulation outputs to experimental results on OMEGA, optimizing experimental design is starting to become viable. Through an appropriate parametrization of the initial conditions, we can apply standard nonlinear optimization methods to statistical predictions of the 1-D radiation-hydrodynamics code LILAC to devise improved experimental designs at nontrivial but manageable computational cost. A method is proposed for utilizing performance data from implosions that lie close in parameter space to current best-performing designs in order to suggest new designs with incremental performance improvements.

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Aarne Lees
University of Rochester

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