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Modeling Hohlraum-Based Laser Plasma Instability Experiments N.B. MEEZAN, R.L. BERGER, L. DIVOL, D.E. HINKEL, O.S. JONES, C. NIE-MANN, E.A. WILLIAMS, S.H. GLENZER, L.J. SUTER, Lawrence Livermore National Laboratory — Laser fusion targets must control laser-plasma instabilities (LPI) in order to perform as designed. We present analyses of recent hohlraum LPI experiments from the Omega laser facility. The targets, gold hohlraums filled with gas or SiO₂ foam, are preheated by several 3ω beams before an interaction beam $(2\omega \text{ or } 3\omega)$ is fired along the hohlraum axis. The experiments are simulated in 2-D and 3-D using the code HYDRA. The choice of electron thermal conduction model in HYDRA strongly affects the simulated plasma conditions. This work is part of a larger effort to systematically explore the usefulness of linear gain as a design tool for fusion targets. We find that the measured Raman and Brillouin backscatter scale monotonically with the peak linear gain calculated for the target; however, linear gain is not sufficient to explain all trends in the data. 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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