

Abstract Submitted
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Competitive Laser–Plasma Interaction Processes Near Quarter Critical Relevant to Direct-Drive ICF W. SEKA, D.H. EDGELL, J.F. MYATT, R.S. CRAXTON, A.V. MAXIMOV, R.W. SHORT, Laboratory for Laser Energetics, U. of Rochester — Long-scale-length plasmas created by two sets of defocused laser beams followed by a more tightly set of focused interaction beams exhibit simultaneous stimulated Brillouin scattering (SBS) and stimulated Raman scattering (SRS) close to $n_c/4$ during the presence of the interaction beams. The two-plasmon-decay (TPD) instability is predicted to be above threshold at that time but appears to be suppressed as long as SBS at or very near $n_c/4$ is above threshold. The TPD is observed as soon as SBS disappears. SRS at somewhat lower densities appears unaffected. All the instabilities appear to be multiple-beam driven. The operating ranges, threshold conditions, and gains for these instabilities are obtained from laser–plasma interaction codes using input from two-dimensional hydrodynamic simulations and correspond closely to observations. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-08NA28302.

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