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Modeling Stimulated Raman Scattering in Direct-Drive Inertial Confinement Fusion Plasmas for National Ignition Facility Conditions
A.V. MAXIMOV, J.G. SHAW, J.F. MYATT, R.W. SHORT, Laboratory for Laser Energetics, U. of Rochester — In the plasmas of direct-drive inertial confinement fusion (ICF), the coupling of laser power to the target plasma is strongly influenced by the laser–plasma interaction (LPI) processes driven by multiple crossing laser beams.[1] For the plasma parameters relevant to the conditions of the experiments at the National Ignition Facility (NIF), the threshold of the stimulated Raman scattering (SRS) is usually well exceeded because of the large scale length of the plasma density, making the study of SRS vital for the NIF ICF program. The SRS evolution starts as a convective or absolute instability,[2] and the nonlinear saturation is determined by the ion-acoustic perturbations and kinetic effects. The LPI processes of cross-beam energy transfer and two-plasmon decay also drive the ion-acoustic modes and their interplay with SRS is analyzed. This work was supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

[1]J. F. Myatt *et al.*, Phys. Plasmas **21**, 055501 (2014).
[2]H. Wen *et al.*, Phys. Plasmas **22**, 052704 (2015).

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