Abstract Submitted
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Ion-Acoustic Wave Instability Driven by Laser-Driven Return Currents D.H. FROULA, S.X. HU, J.F. MYATT, Laboratory for Laser Energetics, U. of Rochester, J.S. ROSS, L. DIVOL, S.H. GLENZER, LLNL — Thomson-scattering measurements of the amplitude and frequency of ion-acoustic waves show an instability when the ion-wave damping is reduced. Experimental results from the OMEGA Laser use simultaneous measurements of the electron-plasma wave and ion-acoustic wave features to characterize the plasma (Te, Ti, Z, Ne) and to directly probe the amplitude of the ion-acoustic waves. The ion Landau damping was varied by changing the target material: CH, V, Ag, Au. The amplitude of the plasma wave increased as the ion Landau damping was reduced and became unstable for ZTe/Ti > 50. As the waves grow to wave-breaking amplitudes, their frequency shifts, and turbulence is expected. These results confirm the speculation that heat-flux–driven ion-acoustic fluctuations exist in laser-produced plasmas, which was previously invoked to increase the collision rate and account for anomalous absorption.[1] This work was supported by Laser Basic Science and the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-08NA28302.

[1]S. H. Glenzer *et al.*, Phys. Rev. Lett. **88**, 235002 (2002)

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