Abstract Submitted
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Kinetic-Ion Simulations of Stimulated Brillouin Backscattering in Ignition Target Plasmas and Reduced Models for Nonlinear Saturation[1]

BRUCE COHEN, LAURENT DIVOL, BRUCE LANGDON, ED WILLIAMS, Univ. Cal. Lawrence Livermore Nat. Lab. — 1D and 2D simulations with the BZOHAR[2,3]hybrid code (kinetic PIC ions and Boltzmann fluid electrons) are being used to investigate the saturation of stimulated Brillouin backscatter (SBBS) instability for plasma conditions in ignition campaign experiments in the National Ignition Facility. Ignition targets must be designed so that backscatter is not severe. BZOHAR can simulate ion kinetic and fluid nonlinearities affecting SBBS.[2−4]A reduced model that captures the physics of two-ion-wave-decay instability, ion trapping effects (nonlinear frequency shift and reduction of ion Landau damping[4]), and pump depletion has been synthesized in coupled-mode equations that are being implemented in the pF3d fluid simulation code used for macroscopic 2D and 3D simulations of laser-plasma interactions. Progress will be reported including studies of whether ion trapping can "inflate" SBBS reflectivities by reducing ion Landau damping. Refs.: [2]B.I. Cohen, B.F. Lasinski, A.B. Langdon, and E.A. Williams, Phys. Plasmas 4, 956 (1997). [3]B.I. Cohen, L. Divol, A.B. Langdon, and E.A. Williams, Phys. Plasmas **12**, 052703 (2005) and Phys. Plasmas 13, 022705 (2006). [4]L. Divol, et al., Phys. Plasmas 10, 1822 (2003).

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