Abstract Submitted
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Two-Dimensional Particle-In-Cell Studies of Backward Stimulated Raman and Brillouin Scattering In Laser-Driven Hot Spots[1] LIN YIN, LANL, W. DAUGHTON, U. of Iowa, B.J. ALBRIGHT, K.J. BOWERS[2], J.L. KLINE, D.S. MONTGOMERY, J.C. FERNÁNDEZ, LANL — A parametric coupling involving backward stimulated scattering of a laser and electron beam acoustic modes (BAM) has been described by theory and is observed in 1-D Particle-In-Cell (PIC) simulations [L. Yin et al., Phys. Rev. Lett., submitted (2004)]. The BAM evolve from Langmuir waves as the electron velocity distribution is nonlinearly modified, resulting in reduced damping at the parametric resonance where enhanced reflectivity pulses are coupled to an electrostatic streak, as observed in the Trident single hot spot experiments at LANL [J. L. Kline et al., Phys. Rev. Lett., 94, 175003, 2005]. In this work, SRS is further examined using 2D PIC simulations, including processes in which the spectral streaking can be arrested by 2D effects, such as the transverse loss of hot electrons and filamentation of the laser speckle, and by the inclusion of the ion dynamics. Changes in ion composition that could result in a clear transition from an SRS- to SBS-dominated regime are also identified.

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