Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

**Saturation of stimulated Brillouin scattering by ion acoustic wave bowing and breakup** LIN YIN, BRIAN ALBRIGHT, DAVID MONTGOMERY, BEN BERGEN, KEVIN BOWERS, Los Alamos National Laboratory — In laser-driven fusion and high-energy-density physics experiments, two crossing laser beams can transfer energy between one another via stimulated Brillouin scattering (SBS) involving the two laser beams and an ion acoustic wave (IAW). Obtaining a physics-based understanding of the nonlinear saturation of cross-beam energy transfer is important to low-mode asymmetry control in ICF implosions. In this work, nonlinear saturation of SBS in speckled laser beams is examined in the kinetic regime using 2D and 3D particle-in-cell simulations. Rapid SBS saturation is found to be caused by IAW bowing from trapped particle nonlinear frequency shift and IAW break up in the direction transverse to the laser. Both processes can lead to rapid loss of trapped ions in regions of small transverse extent during IAW bowing and breakup and dissipation of wave energy.

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Date submitted: 10 Jul 2014 Electronic form version 1.4