

Abstract Submitted
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Implementation of an SRS-SBS interaction model¹ T.N. LERRO, E.S. DODD, D.F. DUBOIS, Los Alamos National Laboratory — Previous work in experiment and theory has shown an anti-correlation of SRS and SBS reflectivities. A dependence of SRS reflectivity on ion-acoustic wave (IAW) damping has also been demonstrated experimentally. In this poster we will show recent work implementing a physical model for this effect into LLNL's pF3D code. PIC simulation results demonstrating the SRS-SBS anti-correlation were compared with theory based on the frequency detuning of the SRS-driven Langmuir wave (LW) due to the density modulation resulting from the SBS-driven IAW. The calculated modified-LW dispersion agreed well with LW modes measured in the PIC results. A new frequency calculation, based on the SRS-SBS interaction, will be added to the code. The purpose of pF3D is to predict the level of laser-plasma interactions present in fusion ignition targets at the NIF, and thus all relevant physics must be included. The IAW-damping dependence of SRS has also been attributed to pump-depletion and Langmuir decay of the SRS LW, in addition to the mode-coupling. The dependence of SRS on IAW-damping could be used as a strategy to reduce reflectivities, if the dominant mechanism is identified.

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