Abstract Submitted
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Thermal effects on the electron density fluctuation spectra in NIF plasmas[1] W. ROZMUS, University of Alberta, T. CHAPMAN, LLNL, M. TZOUFRAS, UCLA, R. BERGER, LLNL, S. BRUNNER, Ecole Polytechnique Lausanne, L. DIVOL, P. MICHEL, E. WILLIAMS, S. GLENZER, LLNL — The high flux model of ignition-scale hohlraum plasmas includes the strong thermal flux from the region of laser beam overlap at the entrance hole of the hohlraum along the directions of the inner cone beams. We have examined results of this large heat flow at the kinetic level using Fokker-Planck codes, which reproduce the temperature profile and corresponding electron distribution functions on the millimeter scale of NIF plasmas. Using the first harmonic of the electron distribution, we have identified contributions from the energetic, heat carrying electrons and the return current component within the bulk of the distribution function. In hot NIF plasmas, the heat-carrying electrons have energies (20-40 keV) that are close to resonance with Langmuir waves produced by SRS. By calculating the plasma dielectric function using distribution functions extracted from Fokker-Planck simulations, we have found a significant reduction in the linear Landau damping for the Langmuir waves propagating in the direction of heat flow, potentially contributing to the onset of backward SRS. This effect was further examined in Vlasov simulations and by calculations of the electrostatic fluctuation levels.

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