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Kinetic Behaviour of SRS in Long Scale-length Plasmas Relevant to Shock-Ignition on the National Ignition Facility[1] A.G. SEATON, T.D. ARBER, University of Warwick — The behaviour of Laser-plasma instabilities (LPI) at laser intensities of 10^{15}-10^{16}Wcm^{-2} is of fundamental importance to the shock-ignition scheme. A key issue is understanding the hot-electron distribution produced by LPIs and whether this will strengthen the ignitor shock sufficiently or cause an unacceptable level of preheat. We recently performed 2D PIC simulations relevant to shock-ignition in short ($L_n = 170\mu$m) and long ($L_n = 600\mu$m) scale-length plasmas characteristic of experiments at OMEGA and the NIF respectively. We previously reported our initial findings of a transition from the TPD-dominated OMEGA-scale regime to the SRS-dominated regime at NIF-scale. In this talk we focus on the behaviour of SRS at NIF-scale. SRS backscattered light is observed with a divergence half-angle ranging up to approximately 60 and a spectrum that includes significant contributions from densities below the Landau cutoff. Kinetic inflation plays a key role in enhancing SRS activity at low density, and we discuss the detailed interplay of this and other nonlinear effects. Finally, we comment on the hot-electron output, which is found to have a low characteristic temperature.

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