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Light Amplification by Seeded Stimulated Raman Scattering of a Crossing Beam and Its Saturation as is Relevant to Ignition Experiments R.K. KIRKWOOD, Y. PING, S.C. WILKS, N. MEEZAN, P. MICHEL, E.A. WILLIAMS, D. CLARK, L.J. SUTER, O.L. LANDEN, LLNL, N.J. FISCH, E.O. VALEO, V. MALKIN, Princeton, J. WURTELE, UCB/LBL, T.L. WANG, S.F. MARTINS, C. JOSHI, UCLA — Experiments with Janus laser seed the SRS of a 1ns 1054 nm beam with a frequency shifted 3.5 ps pulse, in a plasma in which the resonant density and temperature exist over a $<\sim$ 2mm interaction length. The hot ($< \sim$ 240 eV), low density (n/nc = 0.01), plasma created in the experiments produces a low gain spatial rate, similar to what is experienced by the outgoing SRS scatter which is generated in the interior of indirect drive ignition targets when it subsequently interacts with multiple incoming beams. The experiments show that even with a 1 x 10^{14} W/cm^2 pump intensity, gains of greater than 20x can occur under these conditions. The observed amplification is seen to reduce as seed energy increases, consistent with the scattering waves being saturated by electron kinetic effects that operate on the 3.5 ps time scale, (ie; electron trapping), and scaling like 1D PIC simulations. These results benchmark models used to design USP plasma amplifiers, and indirect drive ignition targets. This Work was performed under the auspices of the U.S. DOE by Lawrence Livermore Lab under contract No. DE-AC52-A27344, LLNL-ABS-405480.

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