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How external magnetic fields alter the parameter dependence of reflectivity in stimulated Raman scattering[1] B. J. WINJUM, A. TABLEMAN, F. S. TSUNG, W. B. MORI, UCLA — We show the parameter dependence of stimulated Raman scattering (SRS) reflectivity over a range of electron temperatures and densities, laser intensities, and external magnetic field (B_0) amplitudes and orientations in particle-in-cell simulations with $k\lambda_D = 0.2-0.4$ for the backscatter plasma wave. B_0 can modify kinetic SRS by altering the phasespace dynamics of trapped particles. We show how B_0 (both in amplitude and in orientation relative to the incident laser wavevector) affects the onset intensity and threshold values for reflectivity. Without an external field, and for constant $k\lambda_D$, lower electron densities have lower reflectivities, since SRS saturates at amplitudes for which the detuning rate due to the nonlinear frequency shift is on the order of the growth rate. Lower reflectivities are also seen for shorter speckle lengths in multi-speckle ensembles. The sensitivity of SRS reflectivity to B_0 depends on the underlying kinetic physics, though we comment on generalities and the parameter regimes for which B_0 eliminates kinetic SRS reflectivity.

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