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Spatially autoresonant stimulated Raman scattering in inhomogeneous plasmas in the kinetic regime T. CHAPMAN, S. HULLER, Ecole Polytechnique, Palaiseau, P.E. MASSON-LABORDE, CEA, Arpajon, W. ROZMUS, University of Alberta, Edmonton, D. PESME, Ecole Polytechnique, Palaiseau — The impact of spatial autoresonance on backward stimulated Raman scattering in inhomogeneous plasmas in the kinetic regime is investigated. Starting from the system of three coupled wave equations, the inclusion of a nonlinear frequency shift due to kinetic effects in the equation of the electron plasma wave is found to lead to a cancellation of the frequency shift due to the density gradient. Through the amplitude of the electron plasma wave, the kinetic nonlinear frequency shift is observed to self-adjust to maintain this cancellation over a region in space, giving rise to phase-locked solutions to the electron plasma wave equation. A reduced model is employed to provide analytic insight to the autoresonant wave coupling solutions and comparisons with 1D PIC simulations are made.

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