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Water bag model for kinetic Raman scattering in a nonuniform plasma[1] LAZAR FRIEDLAND, PAVEL KHAIN, Hebrew University of Jerusalem — Resonant wave interactions play a major role in plasmas and other nonlinear media. Resonantly driven waves may exhibit autoresonance, i.e. a continuous nonlinear phase-locking despite variation of system parameters [1]. Recently, we have presented a kinetic autoresonant plasma wave paradigm, where a driven BGK mode was excited in a uniform plasma by slow variation of the driving wave frequency [2]. Similarly, autoresonant BGK modes can be excited in nonuniform plasmas, driven by a constant frequency wave resulting from beating between two laser beams. We will suggest a water-bag model of a nonuniform plasma and formulate a Lagrangian theory of autoresonant three-wave interactions involving two laser waves and a BGK mode. The evolution of such a driven BGK mode will be illustrated in Liouville-type numerical simulations.

[1] L. Friedland, Scholarpedia 4, 5473 (2009).
[2] P. Khain and L. Friedland, Phys. Plasmas 17, 102308 (2010).

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