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Nonlinear, Local Kinetic Damping of Finite-Size Plasma Waves Relevant to Stimulated Raman Scattering WARREN MORI, JAY FAHLEN, BENJAMIN WINJUM, THOMAS GRISMAYER, VIKTOR DECYK — Computer simulations of stimulated Raman scattering (SRS) indicate that the instability is bursty in time and space, leading to finite-size plasma waves in both the longitudinal and transverse directions. Using particle-in-cell (PIC) simulations with an external, ponderomotive impulse driver, we present the results of detailed study of the nonlinear behavior of finite-sized plasma waves in order to better understand the long-time behavior of SRS reflectivities. In one dimension, we present recently published results (Fahlen *et al.*, PRL **102**, 245002 (2009)) showing that finite-length plasma waves erode from the rear edge as new resonant particles enter and locally damp the packet. In multiple dimensions, recent results show that finite-width plasma waves localize about their axis due primarily to local, kinetic damping at the edges. The simulations are performed using a 1D and 2D electrostatic PIC code, and also using a 2D Darwin PIC code. This work was supported by DOE under Grant Nos. DE-FG52-03-NA00065, DE-FG52-06NA26195, and DE-FG02-03ER54721.

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