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**Nonlinear Plasma Wave Behavior in Multiple Dimensions Relevant to Stimulated Raman Scattering** JAY FAHLEN, UCLA, BEN WINJUM, THOMAS GRISMAYER, VIKTOR DECYK, WARREN MORI — Recent particle-in-cell (PIC) simulations (L. Yin *et al.*, PRL **99**, 265004 (2007) and B. Winjum's poster) of stimulated Raman scattering (SRS) in multiple dimensions indicate that plasma wavefront bowing and localization are important potential nonlinear saturation mechanisms. We present here the results of detailed PIC simulations in which an external, ponderomotive impulse driver generates finite-width plasma waves. These simulations allow careful study of wave behavior over a wide range of parameters. We find that local, kinetic damping effects operate in conjunction with wavefront bowing to localize large-amplitude plasma waves along their axis. The simulations are performed using an electrostatic PIC code, and also a PIC code using the Darwin approximation to solve for the electric and magnetic fields without radiation. This work was supported by DOE under Grant Nos. DE-FG52-03-NA00065, DE-FG52-06NA26195, and DE-FG02-03ER54721.

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