Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Simulation of stimulated Raman scattering in 2D WOJCIECH ROZMUS, University of Alberta, Edmonton, Alberta, Canadaa, P.-E. MASSON-LABORDE, ZHONGLING PENG, University of Alberta, Edmonton, Alberta, Canada, V.YU. BYCHENKOV, P.N. Lebedev Physics Institute, RAS, Moscow, Russia, C.E. CAPJACK, University of Alberta, Edmonton, Alberta, Canada — Results of particle-in-cell (PIC) simulations of the stimulated Raman scattering (SRS) in one and two spatial dimensions are discussed. With the focus on plasma conditions corresponding to large $k\lambda_D$ values of SRS driven Langmuir waves ($k\lambda_D > 0.2$) we examine secondary instabilities of plasma waves in the presence of trapped particles. For $k\lambda_D > 0.3$ transverse trapped particle modulational instability (Rose, Phys. Plasmas **12**, 2005) dominates nonlinear evolution of SRS. We have studied interplay between Langmuir decay and modulation instability in the intermediate regime of $k\lambda_D \sim 0.2$. New effects are examined in two spatial dimensions where large fraction of trapped particles gives rise to electric current of fast electrons and the generation of magnetic field. Magnetic field and the transverse ponderomotive force of localized Langmuir waves modify trapped particle dynamics and alter frequency shift and side loss damping of Langmuir waves. Experimental signatures of the 2D effects such as angular broadening of the backscattered light are discussed.

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Date submitted: 23 Jul 2007 Electronic form version 1.4