

Abstract Submitted  
for the DPP07 Meeting of  
The American Physical Society

**The Role of Pump Depletion in Stimulated Raman Scattering for NIF Parameters** B.J. WINJUM, J. FAHLEN, F.S. TSUNG, W.B. MORI, UCLA — Using the full-PIC code OSIRIS in 1D, we have studied stimulated Raman scattering (SRS) in a range of parameters relevant to NIF. In recent years, a wide range of trapped particle effects have been implicated in the behavior of SRS in this regime: detuning due to a kinetic frequency shift, beam modes, electron-acoustic Thompson scattering from these beam modes, and sidebands (the trapped-particle instability). Relatively little mention has been made of pump depletion. We will present results demonstrating that for some parameter ranges, pump depletion due to a convecting scattered packet is the primary mechanism for wave saturation. Furthermore, once pump depletion saturates the instability, the laser can still Raman scatter off the nonlinear, convective plasma wave groups. Once a localized pulse of plasma waves has convected out of the system, or traveled a distance sufficient for convective growth to recur, the instability may restart again. We also show that the behavior changes dramatically when the plasma length becomes much longer than the convective gain length. Work supported by DOE under DE-FG52-06NA26195 and NSF under NSF-Phy-0321345. Simulations performed on the DAWSON Cluster.

Benjamin Winjum  
UCLA

Date submitted: 24 Jul 2007

Electronic form version 1.4