Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Two dimensional particle simulations of Raman backward amplifier[1] MIN HUR, ILMOON HWANG, HYYONG SUK, KERI, RYAN LINDBERG, ANDY CHARMAN, JOSH REMBAUM, UC Berkeley, JONATHAN WURTELE, UC Berkeley, LBNL — We carried out two-dimensional particle simulations of the Raman backward amplifier. The particle code is based on the one-dimensional averaged-PIC (aPIC) code [1]. From the speculation that the longitudinal ponderomotive driving by the two counter-propagating lasers is quite dominant over the transverse one, the two-dimensional version of the aPIC can be easily built up by putting many one-dimensional aPIC solvers in parallel. The solvers are coupled by the diffraction terms of the lasers, which enables one to simulate the transverse effects in the Raman backward amplifier. One of the most important issues regarding the transverse effects is the focusability of the amplified pulse. Previous simulations [2-3], which are based on the fluid model, show that the focusing phase of the seed laser is preserved well during the amplification process. However, there has scarcely been kinetic studies on the same problem. Various simulations from the fully kinetic two-dimensional aPIC are presented. We discuss the kinetic effects (electron trapping) on the focusablity of the amplified seed. [1] M.S. Hur, G. Penn, J.S. Wurtele, and R. Lindberg, Phys. Plasmas vol. 11, p. 5204 (2004). [2] A.A. Solodov, V.M. Malkin, and N.J. Fisch, Phys. Plasmas vol. 10, p. 2540 (2003). [3] G.M. Fraiman, N.A. Yampolsky, V.M. Malkin, and N.J. Fisch, Phys. Plasmas vol. 9, p.3617 (2002).

[1]This work was supported by Creative Research Initiatives, Korea

Min Hur
KERI

Date submitted: 24 Jul 2005 Electronic form version 1.4