KEEN Wave Dynamics: Self-Consistent Trapping Multimode Field-Trapped Particle Nonstationary Dynamical States[1] KIRK WON, BEDROS AFEYAN, VLAD SAVCHENKO, Polymath Research Inc., PHILIP MORRISON, University of Texas, Austin, TUDOR JOHNSTON, INRS-EMT — We use Vlasov-Poisson and Vlasov-Maxwell simulations to model the interaction of ponderomotively driven KEEN waves (1) and Electron Plasma Waves. We focus on categorizing and statistically describing the distinguished sets of particle orbits which make up KEEN waves. These involve nonlocal trapping-untrappping-retrapping oscillations in space and time. We also study the action conservation properties of trapped orbits and their energy exchange mechanism with their self consistent trapping electric field. These new nonlinear states have potential impact on the nonlinear saturation of parametric instabilities in laser-produced plasmas in short and long laser pulse regimes.

(1) B. Afeyan et al., Proc. IFSA (Inertial Fusion Sciences and Applications 2003, Monterey, CA), 213, B. Hammel, D. Meyerhofer, J. Meyer-ter-Vehn and H. Azechi, editors, American Nuclear Society, 2004.

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Date submitted: 26 Jul 2005   Electronic form version 1.4