Abstract Submitted for the DPP05 Meeting of The American Physical Society

Dielectric Response of a Laser-Exploded Cluster to a Perturbing Field J.P. PALASTRO, T.M. ANTONSEN, A. GUPTA, IREAP, University of Maryland — The optical properties of a gas of laser-pulse exploded clusters are determined by the time evolving polarizabilities of individual clusters. The polarizability depends on both the inner core electrons, which are largely shielded from the laser field, and an outer halo of hot electrons created by the laser pulse. We calculate the linear polarizability using the Vlasov equation. The equilibrium is calculated for a bi-maxwellian distribution that models both the hot and cold electrons. We then perturb the system to first order in field and integrate the response of individual electrons to the self consistent field following unperturbed orbits. By considering an ensemble of equilibrium orbits, the linear local and non-local responses have been accounted for. Using this method, we investigate the dependence of polarizability on frequency. Work supported by NSF and USDOE.

> John Palastro IREAP, University of Maryland

Date submitted: 25 Jul 2005

Electronic form version 1.4