Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Scaling of Energy Deposition in Fast Ignition Targets R.B. CAMPBELL, S.A. SLUTZ, T.A. MEHLHORN, Sandia National Laboratories, DALE WELCH, Mission Research Corporation — We examine the scaling to ignition of the energy deposition of laser generated electrons in compressed fast ignition cores. Relevant cores have densities of several hundred g/cm^3, with a few keV initial temperature. As the laser intensities increase approaching ignition systems, on the order of a few 10^{21}W/cm^2, the hot electron energies expected to approach 100MeV[1]. Most certainly anomalous processes must play a role in the energy transfer, but the exact nature of these processes, as well as a practical way to model them, remain open issues. Traditional PIC explicit methods are limited to low densities on current and anticipated computing platforms, so the study of relevant parameter ranges has received so far little attention. We use LSP[2] to examine a relativistic electron beam (presumed generated from a laser plasma interaction) of legislated energy and angular distribution is injected into a 3D block of compressed DT. Collective effects will determine the stopping, most likely driven by magnetic field filamentation. The scaling of the stopping as a function of block density and temperature, as well as hot electron current and laser intensity is presented. Sub-grid models may be profitably used and degenerate effects included in the solution of this problem. Sandia is operated by Sandia Corporation, for the USDOE. [1] A. Pukhov, *et. al., Phys. Plas.* **6**, p2847 (1999) [2] D. R. Welch *et al.*, *Comput. Phys.Commun.* **164**, p183 (2004).

Thomas Mehlhorn
Sandia National Laboratories

Date submitted: 22 Jul 2005 Electronic form version 1.4