Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

**Hot Electron Confinement in High Intensity Laser-Matter Interactions**

LEE ELBERSON, University of Maryland, YUAN PING, SCOTT WILKS, RONNIE SHERHERD, ANDREW MACKINNON, PRAV PATEL, LLNL, WENDELL HILL, University of Maryland — High-intensity (>10^{18} \text{ W/cm}^2) lasers can produce relativistic electrons (∼MeV) when focused onto solid density targets. We present measurements of escaped relativistic electron lifetimes in short pulse laser-irradiated solid experiments. Electron durations measured were significantly longer than the laser pulse length, suggesting the presence of phenomena which confine high energy electrons within the target-plasma volume. Investigating the confinement time of high energy electrons exceeds the limits of any simple plasma expansion models. Utilizing the implicit hybrid particle-in-cell code LSP [D. R. Welch *et al.*, Phys. Plasmas 13, 063105 (2006)], experimental conditions were simulated to explore the physics of hot electron confinement in laser-irradiated materials. *This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Lee Elberson
University of Maryland

Date submitted: 17 Jul 2009

Electronic form version 1.4