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Hot Electron Confinement in High Intensity Laser-Matter Interactions LEE ELBERSON, YUAN PING, RONNIE SHEPHERD, SCOTT WILKS, ANDREW MACKINNON, PRAV PATEL, Lawrence Livermore National Laboratory, WENDELL HILL, wth@umd.edu — High-intensity ($>10^{18}$ W/cm^2) lasers can produce relativistic electrons ($\sim$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.

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