Abstract Submitted
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Hot electron effects in laser driven shock ignition* R.C. KIRKPATRICK, R.J. MASON, R.J. FAEHL, RAC, R. BETTI, A. SOLODOV, LLE — Shock Ignition[1](SI) emphasizes a final, hundred-ps scale, shock-driving laser pulse, after the slower adiabatic direct-drive compression of a fueled target over several ns. Hot electrons produced during this final spike can preheat the fuel and diffuse the shock, degrading the final compression. This issue is also relevant to the earliest "optimal" direct drive pulses with a final intensity rise[2]. Here, we use the ePLAS[3] implicit/hybrid code to study the quality of shocks generated at anticipated ~8 x 10^{15} W/cm^2 peak intensities for SI in compressed hydrogen. The code tracks laser light rays to the critical density, absorbs and emits prescribed 35 keV "hot" electrons isotropically as a fluid. These hot electrons then flow under self-consistent *E&B*-fields, while scattering off background ions, and dragging to low energy against the background electrons. After 65 ps we find that they have heated the background ions and electrons to 300 eV near critical, and initiated shock formation beyond it. By 520 ps a strong shock has been launched, showing more than a 2-fold frontal density rise, and corresponding pressure jump. The dependence of shock quality on peak laser intensity and the generated hot electron spectrum will be discussed. 1. R. Betti et al, PRL **98,** 155001 (2007), 2. R. Mason and R. Morse, PoF **18,** 814 & 816 (1975), and 3. R. Mason, PRL **96,** 035001 (2006). *Supported partially by USDOE, DE-FG02-07ER84723.

R.J. Mason
RAC

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