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Two-Dimensional Simulations of Electron Shock Ignition at the Megajoule Scale W. SHANG, R. BETTI, Laboratory for Laser Energetics, Fusion Science Center, and Depts. of Mechanical Engineering and Physics and Astronomy, U. of Rochester — Shock ignition uses a late strong shock to ignite the hot spot of an inertial confinement fusion capsule. In the standard shock-ignition scheme, an ignitor shock is launched by the ablation pressure from a spike in laser intensity. Recent experiments on OMEGA[1] have shown that focused beams with intensity up to 6×10^{15}W/cm^2 can produce copious amounts of hot electrons. The hot electrons are produced by laser–plasma instabilities (LPI's) and can carry up to $\sim 15\%$ of the instantaneous laser power. Megajoule-scale targets will likely produce even more hot electrons because of the large plasma scale length. We show that it is possible to design ignition targets with low implosion velocities that can be shock ignited using LPI-generated hot electrons to obtain high energy gains. These designs are robust to low-mode asymmetries and they ignite even for highly distorted implosions. Electron shock ignition requires tens of kilojoules of hot electrons, which can only be produced on a large laser facility like the National Ignition Facility. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

[1]R. Nora *et al.*, Phys. Rev. Lett. **114**, 045001 (2015); W. Theobald *et al.*, Phys. Plasmas **22**, 056310 (2015).

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