Abstract Submitted
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Advanced concepts for fast-ignition from 2D ANTHEM modeling[1] R.J. MASON[2], Los Alamos National Laboratory — The 2D implicit PIC/hybrid code ANTHEM has recently been used to model foil interactions with both steep and shallow density gradients, and fast-ignition cone-target experiments with super-compressed thermonuclear fuel cores. For these it has employed 1.06 μm picosecond laser intensities exceeding 4 x 10^{19} W/cm^2 and core densities $\geq 10^{25}$ electrons/cm^3. ANTHEM's mesh-following algorithm delivers laser energy to the critical surface, where it emits relativisitic electrons, which can be focused by the prevailing density and intensity profiles to deposit effectively more deeply. We shall show that heating of the core derives from conduction in from the blowoff cloud, ram and joule heating of the return currents, but mostly by the hot electron drag – the range for which is a subject of present controversy. Core heating may be increased by design changes to bring higher hot electron densities to the core, such as a lightning rod cone tip, nested cone shells for vacuum insulation, and the use of shorter wavelength fast drivers to decrease the hot electron range.

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