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Resistive filamentation and collimation of relativistic electron beams in the fast ignition scenario JAVIER HONRUBIA, ARNAUD DEBAYLE, Technical University of Madrid, Spain, EMMANUEL D'HUMIERES, CELIA, Universite Bordeaux 1, France, SAMUEL MICHEAU, The Queens University of Belfast, U.K., VLADIMIR TIKHONCHUK, CELIA, Universite Bordeaux 1, France — We have reported recently resistive filamentation and magnetic collimation of relativistic electron beams with currents around 1 GA and 10 – 20 ps pulses [J.J. Honrubia and J. Meyer-ter-Vehn, *Nucl. Fus.* **46**, L25 (2006): *Plasma Phys. Control. Fus.* **51**, 014008 (2009).]. Beam collimation due to self-generated magnetic fields reduces significantly the ignition threshold of imploded fuel capsules and depends strongly on the source size and the initial distribution function of relativistic electrons. We will demonstrate fast ignition integrated simulations in 2D axi-symmetric geometry including 1) laser-driven relativistic electron sources obtained by 2D PIC simulations for actual laser intensities and pulse durations, 2) optimized configurations of the assembled fuel in re-entrant cone targets, and 3) interaction of fast electrons with the cone tip. The material of the cone tip has been selected as a compromise between hydrodynamic and electron transport requirements to guarantee the cone tip survival and to minimize the electron energy loss and scattering. We will provide estimates for the ignition energies.

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