Abstract Submitted
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Fokker-Planck modeling of fast electron transport including hydrodynamic plasma response[1] R.J. KINGHAM, C.P. RIDGERS, R.G. EVANS, S.J. ROSE, Plasma Physics Group, Imperial College London, A.P.L. ROBINSON, Rutherford Appleton Laboratory, UK — The fast electron beam required for the fast ignition approach to ICF has to couple ∼10kJ of energy from the critical surface to the core in ∼10ps. The intense pressure gradients and B-fields generated by the beam should be capable of significantly modifying the density of the background plasma. Over several picoseconds there is sufficient time for ions to be expelled, forming a channel, especially at densities up to and including solid density. Hybrid code simulations have shown that a static density channel can induce hollowing of a fast electron beam [1]. We are developing a new 2-D Vlasov-Fokker-Planck code for simulating fast electron transport in regimes relevant to fast ignition. It uses a spherical harmonic representation of the electron distribution (as used in KALOS and [1]) and self-consistently includes hydrodynamic response of the plasma for the first time. Its kinetic description of all electrons is essential when the beam density approaches the background density and hydro is essential for correctly capturing the dynamics of multi-ps duration beams. Progress on its development will be reported.
[1] A. P. L. Robinson *et al.*, Plasma Phys. Control. Fusion **50**, 065019 (2008)

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