

Abstract Submitted  
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**A new type of hybrid code for fast-electron transport with hydrodynamic response**<sup>1</sup> ROBERT KINGHAM, BRENNIG WILLIAMS, Imperial College London — We present a new hybrid code, relevant to fast-ignition, with PIC fast-electrons coupled to a Vlasov-Fokker-Planck (VFP) background plasma. Using the VFP code IMPACT [1] for the plasma provides a more complete Ohm's law & heat-flow description than fluid models, conventionally used. Transport in the plasma includes magnetization effects & non-local effects when the background is driven hard by the beam. Phenomena such as Nernst advection of B-fields, resistive &  $\nabla n \times \nabla T$  B-field generation are included. The code also includes ionization. As it is a hybrid code, several picosecond timescales are easily achievable. This makes the code well suited to study the effects of hydrodynamics on fast-electron transport [2], such as re-collimation of the beam due to PdV cooling in the background plasma [3]. The code has been tested against relevant beam-plasma instabilities and is being used to study systems with parameters relevant to FI. We present new results of fast-electrons travelling through a solid density background with hydrodynamic response.

[1] Kingham RJ & Bell AR, JCP **194**, 1(2004)

[2] Bush IA *et al.*, PPCF **52** 125007 (2010)

[3] Kingham RJ *et al.*, J. Phys.: Conf. Ser. **244** 022042 (2010)

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