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A Vlasov-Fokker-Planck Code for Shock Ignition MICHAIL TZOUFRAS, TONY BELL, University of Oxford, UK, RAOUL TRINES, PETER NORREYS, RAL, UK, FRANK TSUNG, UCLA — A 2D3P parallel object-oriented Vlasov-Fokker-Planck code that relies on the expansion of the electron distribution function to spherical harmonics [1] has been developed and it is used to study non-local electron transport for Shock Ignition [2]. The code makes use of a rigorous formalism for the collisions between electrons, which derives from the Rosenbluth potentials and conserves energy and number. This code makes it possible to accurately model the kinetic as well as the hydrodynamic behavior of the plasma and is particularly efficient for collisional plasmas. The features of the code are showcased using standard plasma physics problems. For Shock Ignition the electron temperatures can reach up to 100keV while densities range from less than critical to greater than solid. Shock Ignition is therefore an excellent candidate for this VFP code, because the target is sufficiently collisional to allow for extremely efficient modeling.

[1] A. R. Bell et al, Plasma Phys. Control. Fusion 48, R37-R57 (2006).
[2] R. Betti et al, Phys. Rev. Lett. 98, 155001 (2007).

Michail Tzoufras
University of Oxford, UK

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