Abstract Submitted
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Modeling of Weakly Collisional Parallel Electron Transport for Edge Plasma Simulations[1] M.V. UMANSKY, A.M. DIMITS, I. JOSEPH, LLNL, J.T. OMOTANI, Culham Labs, T.D. ROGNLIEN, LLNL — The parallel electron heat transport in a weakly collisional regime can be represented in the framework of the Landau-fluid (LF) model [1]. Practical implementation of LF-based transport models has become possible due to the recent invention of an efficient non- spectral method for the non-local closure operators [2]. Here the implementation of a LF based model for the parallel plasma transport is described, and the model is tested for different collisionality regimes against a Fokker-Plank code [3]. The new method appears to represent weakly collisional parallel electron transport more accurately than the conventional flux-limiter based models; on the other hand it is computationally efficient enough to be used in tokamak edge plasma simulations. Implementation of an LF-based model for the parallel plasma transport in the UEDGE code is described, and applications to realistic divertor simulations are discussed.

[1] G.W. Hammett and F.W. Perkins, Phys.Rev.Lett., 64, 3019(1990).
[2] A.M. Dimits et al., Phys. Plasmas 21, 055907 (2014).
[3] J.T. Omotani and B.D. Dudson, PPCF 55, 055009 (2013).

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