Abstract Submitted
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Gyrokinetic Models for Edge Plasmas[1] A.M. DIMITS, R.H. COHEN, X.Q. XU, LLNL, AND THE ESL TEAM — We summarize a gyrokinetic model for charged-particle species in MFE edge plasmas and address several important issues. 1) The gyrokinetic Vlasov equations should be in conservation form to facilitate a conservative discretization. 2) The differences between the orderings used and results obtained by Qin et. al. [electromagnetic, and targeted to edge plasmas; Phys. Plasmas 14, 056110 (2007)] and Hahm et al. [electrostatic and targeted to core transport barriers; Phys. Plasmas 3, 4658 (1996)] are examined. Both assume that the electric potential is split into a large long-wavelength part and a small-amplitude perturbed part. Qin asserts that his particular form of the second-order potential is needed for energy conservation. 3) We examine practical forms of the gyrokinetic Poisson-Maxwell equations for the case when the perturbations are neither small-amplitude nor long-wavelength. 4) We build on the theoretical formulations of large-amplitude Gyrokinetic Coulomb collision operators (when linearization does not apply; e.g., by Brizard and by Qin et. al.) to develop an operator suitable for numerical implementation.

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