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Treatment of Kinetic Electrons in Eulerian Gyrokinetics[1] J. CANDY, R.E. WALTZ, M.N. ROSENBLUTH, General Atomics — An accurate description of electromagnetic turbulence in fusion plasmas requires an equally accurate treatment of the essential features of the electron dynamics. It is well-known, however, that a numerical treatment of kinetic electrons is challenging. Fast parallel dynamics places a tight Courant limit on explicit solvers. The difficulties are further exacerbated by the appearance of new unstable numerical "box modes". In this poster we discuss the most robust numerical methods that can be used to overcome the new challenges posed by a kinetic treatment of electrons. We note that these box modes are generally reduced in severity by the addition of electromagnetic fluctuations and the corresponding Alfven timescale of oscillations. Finally, we report on first results for global simulation of electromagnetic turbulence.

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Special instructions: Poster 15, Transport, Boundary Plasma

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