

Abstract Submitted
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Collisional tests and an extension of the TEMPEST continuum gyrokinetic code¹ R.H. COHEN, M. DORR, J. HITTINGER, G. KERBEL, W.M. NEVINS, T. ROGNLIEN, Z. XIONG, X.Q. XU, LLNL — An important requirement of a kinetic code for edge plasmas is the ability to accurately treat the effect of collisions over a broad range of collisionalities. To test the interaction of collisions and parallel streaming, TEMPEST has been compared with published analytic² and numerical (Monte Carlo, bounce-averaged Fokker-Planck) results for endloss of particles confined by combined electrostatic and magnetic wells. Good agreement is found over a wide range of collisionality, confining potential and mirror ratio, and the required velocity space resolution is modest. We also describe progress toward extension of (4-dimensional) TEMPEST into a “kinetic edge transport code” (a kinetic counterpart of UEDGE). The extension includes averaging of the gyrokinetic equations over fast timescales and approximating the averaged quadratic terms by diffusion terms which respect the boundaries of inaccessible regions in phase space.

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²F. Najmabadi, R.W. Conn and R.H. Cohen, Nucl. Fusion 24, 75 (1984); T.D. Rognlien and T.A. Cutler, Nucl. Fusion 20, 1003 (1980).

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