

Abstract Submitted
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Application of GEM Code for Experimentally-Realistic Tokamak Cases¹ G. REWOLDT, W.M. TANG, Princeton Plasma Physics Lab., Y. CHEN, S.E. PARKER, U. Colorado Boulder CIPS — The GEM code is a gyrokinetic electromagnetic nonlinear particle-in-cell simulation code[1]. It has recently been extended to be radially global[2], using the Miller toroidal MHD equilibrium[3]. In recent work, the GEM code has been interfaced with the TRANSP experimental data system[4]. In particular, the GEM code calculations can now include experimentally-derived TRANSP density and temperature profiles for the electron and background ion species, as well as for an impurity species and a hot beam ion species, with trapped electrons and electron collisions, and including self-generated and externally-driven flow. Preliminary results will be presented for tokamaks such as NSTX and DIII-D.

[1] Y. Chen and S. Parker, *J. Comput. Phys.* **189**, 462 (2003).

[2] Y. Chen and S. Parker, *J. Comput. Phys.*, in press (2006).

[3] R.L. Miller, *et al.*, *Phys. Plasmas* **5**, 973 (1998); R.E. Waltz, *et al.*, *Phys. Plasmas* **6**, 4265 (1999).

[4] R. Goldston, in *Basic Physical Processes of Toroidal Fusion Plasmas*, Varenna Proceedings, (Monotopia Franchi, Città di Castello, 1985), Vol. 1, p. 165.

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