Abstract Submitted
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Global gyrokinetic calculations for experimental cases G. REWOLDT, Princeton Plasma Physics Lab., Y. CHEN, S.E. PARKER, University of Colorado, Boulder — The GEM (gyrokinetic electromagnetic) code[1] is a global particle-in-cell code with relatively complete physics, including non-circular cross section via the Miller MHD equilibrium, multiple ion species, electron collisions, and perpendicular ($\mathbf{E} \times \mathbf{B}$) and parallel equilibrium flows, and now can access experimentally-derived profile information from the TRANSP system. A coarse-graining procedure for the electrons has recently been implemented to limit particle weight growth [2]. For a DIII-D case with moderate ion temperatures and moderate rotation, a nonlinear GEM calculation for the core region ($0.1 < r/a < 0.8$) yields maximum ion heat fluxes comparable to experimental values, for the experimental levels of equilibrium flow. Sensitivity of the fluxes to changes in flow and in density and temperature gradients will be discussed. Also, an NSTX case known from flux-tube calculations to be linearly unstable to microtearing modes will be considered in a global nonlinear GEM simulation. [1] Y. Chen and S.E. Parker, J. Comput. Phys. 220, 839 (2007) [2] Y. Chen and S.E. Parker Phys. Plasmas 14, 082301 (2007)

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