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Kinetic electrons in global electromagnetic gyrokinetic particle simulations Y. NISHIMURA, Z. LIN, L. CHEN, UC-Irvine, W. WANG, PPPL, GTC TEAM — Employing an electromagnetic gyrokinetic simulation model,[1] kinetic electron dynamics in global tokamak geometry is investigated. The massless fluid electron model is developed as a base. We further evolve gyrokinetic equations for non-adiabatic kinetic electrons. To obtain the magnetic perturbation, the fluid-kinetic hybrid electron model[1] employs the inverse of the Faraday's law. Instead, the Ampere's law is used as a closure relation to avoid uncertainties in estimating $u_{e\|}$, the moment of the electron velocities. The physics goal is to investigate the finite beta effects on the turbulent transport, as well as α particle driven turbulence.[2]
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[1]Z. Lin and L. Chen, Phys. Plasmas **8**, 1447 (2001).
[2]I. Holod, Z. Lin, *et al.*, this conference.

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