Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Gyrokinetic simulations of electron density fluctuations and comparisons with measurement R.V. BUDNY, E. MAZZUCATO, PPPL, A. FONSECA, CFN-IST, R. BRAVENEC, Univ. Texas, Austin, J. CANDY, R.E. WALTZ, GA, TFTR TEAM, EFDA-JET COLLABORATION — Understanding transport is important for creating reliable predictions of plasma performance in fusion reactors. Plasma turbulence causes much of the transport seen in present experiments. Gyrokinetic codes can simulate turbulence and turbulent-driven transport. Further verifying and validating these simulations are needed. One class of tests is provided by electron density fluctuation $\tilde{n}_e$ measurements using techniques such as reflectometry and beam-emission-spectroscopy. The GYRO gyrokinetic code is being used to simulate turbulence and turbulent-driven energy, angular momentum, and species flows in experiments. GYRO can generate the time-evolving fluctuations of $\tilde{n}_e$ in three spatial dimensions. From this, profiles, along the diagnostic lines-of-sight, of the root-mean-square $\tilde{n}_e$, radial correlation lengths λ_r, and power spectra can be produced. This paper compares on GYRO simulations of reflectometry measurements in TFTR D and DT supershots and JET. Three kinetic species (2 ions and electrons) are assumed, about half the plasma radius is simulated. Realistic geometry and electron-ion collisions are included. Agreement to within about a factor of two is achieved.

Robert Budny
PPPL

Date submitted: 19 Jul 2007 Electronic form version 1.4