Abstract Submitted
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Simulation of turbulence in tokamak edge plasmas[1] M.V. UMANSKY, LLNL, J. BOEDO, UCSD, B. LABOMBARD, MIT, R. MAQUEDA, Nova Photonics, J. TERRY, MIT, S. ZWEBEN, PPPL — We undertake a comparative computational study of edge plasma turbulence in tokamaks. Some, perhaps much, of the physics underlying edge turbulence in existing tokamak experiments can be captured by fluid equations for collisional plasma, however due to the complexity of the problem in most cases one has to rely on numerical simulations. Applying electromagnetic fluid turbulence code BOUT to tokamak edge plasmas we generally find consistency with experimentally known cross-field spatial structure of the N_i fluctuations having characteristic scale on the order of a few cm. Coherent structures moving radially at a speed of a few km/s are also consistent with many experimental observations. However, the numerical results can be sensitive to details of physics model, choice of parameters, and geometry options. Certain parameters are not well known experimentally and thus can serve as free "dialing knobs," e.g. effective ion charge, Z_{eff}, and radial electric field, E_r, at the core boundary. Simulation results and comparative analysis for edge plasmas in Alcator C-Mod, NSTX, and DIII-D will be presented.

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M. V. Umansky
LLNL

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