Abstract Submitted
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Multi-Channel Validation of the Gyrokinetic Transport Model in ITG and TEM Dominant Plasmas[1] N.T. HOWARD, A.E. WHITE, M. GREENWALD, M.L. REINKE, MIT - Plasma Science and Fusion Center, D.R. MIKKELSEN, Princeton Plasma Physics Lab, M. CHILENSKI, A. HUBBARD, J. HUGHES, J.E. RICE, MIT - Plasma Science and Fusion Center, J. CANDY, General Atomics — The need to accurately determine the performance of future fusion devices motivates the development of a predictive model of plasma transport and confinement. On Alcator C-Mod, significant progress has been made in the validation of the gyrokinetic model, the current leading candidate for a predictive transport model. Recent experiments represent an ideal testing ground for the gyrokinetic model in the core of plasmas dominated by both ion (ITG) and electron (TEM) turbulence. In this presentation, results from global, nonlinear simulation using the gyrokinetic code, GYRO, are compared directly with unique measurements of particle impurity transport (provided by laser blow-off and spatially resolved x-ray emission profiles) and power balance levels of heat transport in the plasma core ($0.3 < r/a < 0.7$). To strengthen the quantitative comparison between model and experiment in the plasma core, this multi-channel validation effort consists of a rigorous investigation of experimental uncertainties and their propagation to derived and simulated transport levels. Results from both ion ($k_\theta \rho_s < 1.0$) and electron scale ($k_\theta \rho_s > 1.0$) simulation of plasma turbulence will be shown as part of an ongoing validation effort.

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Nathan Howard
MIT - Plasma Science and Fusion Center

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