Abstract Submitted
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Experimental and gyrokinetic investigation of core impurity transport in Alcator C-mod[1] N. HOWARD, M. GREENWALD, Y. PODPALY, M.L. REINKE, J.E. RICE, A.E. WHITE, MIT - PSFC, D.R. MIKKELSEN, PPPL, T. PUETTERICH, Max Planck Institut fur Plasmaphysik — A new multiple pulse laser blow-off system coupled with an upgraded high resolution x-ray spectrometer with spatial resolution allow for the most detailed studies of impurity transport on Alcator C-mod to date. Trace impurity injections created by the laser blow-off technique were introduced into plasmas with a wide range of parameters and time evolving profiles of He-like calcium were measured. The unique measurement of a single charge state profile and line integrated emission measurements from spectroscopic diagnostics were compared with the simulated emission from the impurity transport code STRAHL. A nonlinear least squares fitting routine was coupled with STRAHL, allowing for core impurity transport coefficients with errors to be determined. With this method, experimental data from trace calcium injections were analyzed and radially dependent, core values ($< r/a \sim .6$) of the diffusive and convective components of the impurity flux were obtained. The STRAHL results are compared with linear and global, nonlinear simulations from the gyrokinetic code GYRO. Results of this comparison and an investigation of the underlying physics associated with turbulent impurity transport will be presented.

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