Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Improved analysis of impurity transport coefficient profiles[1] M.A. CHILENSKI, M. GREENWALD, MIT Plasma Science and Fusion Center, Y. MARZOUK, MIT Department of Aeronautics and Astronautics, N.T. HOWARD, J. RICE, A.E. WHITE, MIT Plasma Science and Fusion Center — Work is underway on the development of a novel technique to estimate impurity transport coefficient profiles and their uncertainties. Inference of impurity transport coefficient profiles using x-ray imaging crystal spectroscopy measurements of laser blow-off impurity injections has played a key role in the validation of gyrokinetic simulations of impurity transport in L-mode (Howard et al. 2012, *Nucl. Fusion* **52**, 063002). Recent attempts to apply the existing methodology for interpreting such measurements to H-mode have failed to yield reliable estimates, however. This failure exposes key issues regarding the uniqueness of the solution and the rigorous estimation of the uncertainty. A new approach is under development which uses a combination of Markov chain Monte Carlo (MCMC) and global optimization techniques to estimate impurity transport coefficient profiles even when there are multiple possible solutions. This poster will present the new methodology in detail and will show preliminary results from applying it to Alcator C-Mod data. This new approach will enable us to test the existing understanding of L-mode impurity transport and to move towards multichannel validation of gyrokinetic simulations of H-modes.

[1]Supported by USDOE award DE-FC02-99ER54512.

Mark Chilenski
MIT Plasma Science and Fusion Center

Date submitted: 24 Jul 2015 Electronic form version 1.4