Abstract Submitted
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Bayesian Inference of H-mode Impurity Transport in Alcator C-Mod[1] F. SCIORTINO, N. HOWARD, Massachusetts Inst of Tech-MIT, M.A. CHILENSKI, Systems and Technology Research, Woburn, MA, 01801, USA, E.S. MARMAR, P. RODRIGUEZ-FERNANDEZ, N.M. CAO, A.J. CREELY, M. GREENWALD, J.E. RICE, A.E. WHITE, J.C. WRIGHT, AND ALCATOR C-MOD TEAM, Massachusetts Inst of Tech-MIT — The investigation of impurity transport offers a compelling pathway for the validation of turbulence models, in particular through the computation of radial profiles of impurity transport coefficients. Such validation effort requires a rigorous computation of uncertainties, which we approach in a Bayesian framework using Gaussian Process Regression and the MultiNest algorithm to sample from multi-dimensional, potentially multi-modal posterior distributions. For the first time, we applied such analysis to determine experimental impurity transport in an Alcator C-Mod EDA H-mode plasma, where impurity confinement times are expected to be larger than in previously analyzed L-mode conditions. Using spatially resolved measurements of Ca +18 provided by an X-ray Imaging Crystal Spectrometer (XICS) and the STRAHL impurity transport code, radial profiles of experimental diffusion and convection coefficients were obtained following the injection of impurities via Laser Blow-Off (LBO). These results constitute the first steps towards constructing an impurity transport experimental database that will be used to provide constraints for gyrokinetic model validation.

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