Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Validating the SOLPS-ITER drift model using C-Mod data[1]
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— To develop practical tokamak fusion reactors, accurate edge plasma transport modeling is critical. The need to properly model impurity transport is particularly acute: injected impurities are necessary to dissipate exhaust power to a level that ensures survival of divertor targets but core impurity contamination must be limited. The advanced capability of the SOLPS-ITER code to capture plasma drifts has made it a focal point of the tokamak community. On the Alcator C-Mod tokamak, exceptionally well-diagnosed experiments with impurity injection have been performed. Available diagnostics include upstream Thomson scattering, target Langmuir probes, divertor neutral pressure, multi-channel spectroscopy, and bolometry. SOLPS-ITER is applied to a 5.4 T, q_{95} =4.9 EDA H-mode, a steady state ELM-free regime, with $q_{||}$ up to 0.4 GW m^{-2}, which has steady phases with and without toroidally symmetric private flux region N_2 injection. Initial results for the phase without N_2 show clearly that drifts are needed to reproduce measured edge plasma profiles. Progress on modeling with drifts and with nitrogen injection will also be reported.

[1]Supported by the ITER Scientist Fellows Network and US DOE awards DE-SC0019473, DE-AC05-00OR22725 and DE-SC0014264.

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Date submitted: 03 Jul 2019 Electronic form version 1.4