Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Influences of 3D Features on 2D Equilibrium Reconstructions[1]
LAURA ZAIDENBERG, University of Michigan, COLIN CHRYSTAL, STEFANO MUNARETTO, TED STRAIT, LANG LAO, General Atomics — In this work, a new method for mapping kinetic profile measurements to magnetic flux surfaces is used to assess discrepancies in the electron and ion densities near the last closed flux surface of DIII-D plasmas. The apparent misalignment between these densities is hypothesized to be the combined result of a misshapen poloidal field coil, toroidal separation between the Thomson scattering and charge exchange recombination spectroscopy (CER) diagnostics, and the assumption of toroidal symmetry in the equilibrium generated by the EFIT reconstruction code. In this work, equilibria are made using two different sets of toroidally displaced magnetic probes in EFIT, one closer to the Thomson location and one closer to the CER toroidal location. The relative alignment of Thomson and CER in these two equilibria is compared to a historical method for aligning the profiles, which shifts the Thomson data based on the results of fitting a modified hyperbolic tangent function to the electron temperature. This comparison is done for limited, single null, and double null plasma shapes, which are affected by the misshapen coil by different amounts.

[1]Supported in part by US DoE under the Science Undergraduate Laboratory Internship (SULI) program and under DE-FC02-04ER54698 and DE-FG02-91-ER54109.

Laura Zaidenberg
University of Michigan

Date submitted: 02 Jul 2019 Electronic form version 1.4