Abstract Submitted for the 56th Annual Meeting
Division of Plasma Physics
October 27–31, 2014
New Orleans, Louisiana

Category Number and Subject:

[ ] Theory [X] Experiment

Validation of the SOLPS Parallel Heat Transport Model,[*]
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Recent SOLPS 2D fluid plasma/neutrals edge transport simulations have shown a consistent under-prediction of radiated power that when accounted for allows simulations to successfully match high resolution divertor and scrape-off-layer density (n_e) and temperature (T_e) measurements near detached conditions in DIII-D. The parallel heat transport model has been evaluated in simulations with the upstream n_e and T_e and divertor heat flux matched to experiments. Simulations of L-mode discharges near detachment onset require either increased carbon sources or hydrogenic recombination radiation to match measured radiative losses. With this increase, the poloidal T_e profile shows good agreement with 2D divertor Thomson scattering data, including an extended region with very low T_e, which cannot be reproduced without the additional radiative loss. Similar scaling of the radiated power also results in agreement for the T_e profile measured in H-mode experiments; however, in this case the plasma data show a poloidally extended region of high n_e that is not captured in simulations.

*Work supported by the US DOE under DE-AC05-00ER22725, DE-FC02-04ER54698 and DE-AC52-07NA27344.