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Modeling Effects of Toroidal Field Direction on Pedestal Structure in DIII-D Steady-State Discharges using SOLPS[1] A.C. SONTAG, J.M. CANIK, L.W. OWEN, M. MURAKAMI, J.M. PARK, ORNL — Core transport models predict that fusion power scales roughly as the square of the pressure at the top of the pedestal, so understanding the effects that determine pedestal structure in steady-state operational scenarios is important in order to project steady-state tokamak operational scenarios developed in DIII-D forward to ITER and other devices. Both experiments and modeling indicate that SOL conditions are important in optimizing the pedestal structure for high-beta steady-state scenarios. The SOLPS code is used to provide interpretive transport analysis of the pedestal and SOL. This work examines the nature of flows, pumping and fueling on the pedestal structure including the effects of drifts in the fluid model. The DIII-D edge diagnostic suite allows for model comparison to density, temperature, flows, impurity transport in the SOL as well as the divertor heat and particle fluxes. This modeling is used to determine why some scenarios in recent DIII-D experiments which require reverse Bt to optimize off-axis neutral beam current drive have reduced pedestal height and width when the grad-B drift is in the unfavorable direction.

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