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Simulation of DIII-D experiments on detachment and divertor closure[1] ERIC MEIER, William and Mary, AUNA MOSER, TONY LEONARD, General Atomics — While divertor detachment is necessary to control the heat flux to divertor targets in ITER and future tokamak fusion devices, detachment is often associated with high pedestal density, which can be problematic for core plasma performance. Divertor closure experiments on DIII-D have shown that the pedestal electron density at detachment is reduced by ˜35% for a configuration with a high degree of outer divertor closure, compared to an open outer divertor configuration. In this work, SOLPS-ITER modeling, with full drift physics engaged, is used to evaluate the experimental open and closed configurations. Realistic power and particle fluxes are assumed at the core boundary. Predicted 2D ionization profiles will be presented, and sensitivity of detachment behavior to particle and thermal diffusivities, cryopump efficiency, and wall pumping assumptions will be addressed. Initial simulations show a 20% decrease in pedestal density at detachment for the closed configuration, and a similar reduction in the pedestal ionization source.

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