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Modeling Detached Divertor Plasma Characteristics in the DIII-D Tokamak[1] T.D. ROGNLIEN, I. JOSEPH, A.G. MCLEAN, G.D. PORTER, M.E. RENSINK, M. UMANSKY, LLNL, M. GROTH, Aalto U., A.Y. PIGAROV, UCSD — Detached divertor-plasma operation, where a large fraction of the core exhaust power is radiated before striking the target plates, is attractive for limiting the peak target heat flux. Such plasmas have electron temperature $\sim$ 1 eV near the target. Changing the position of the separatrix strike points on the geometrically varied DIII-D target plates is allowing a systematic study of how plate shape impacts accessibility to detached operation. Reported here are 2D plasma/neutral transport simulations of these configurations using the UEDGE code including cross-field drifts and impurities. Results are given on how the onset of detachment scales with strike-point location, wall pumping of neutrals, separatrix density, and core power. Different initial conditions sometimes yield different steady-state solutions for identical input parameters, one being an attached plasma and the other detached. Comparisons are made of simulation results and experimental measurements, especially divertor Thomson scattering data.

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