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Analysis of the Impact of Divertor Closure on Detachment in DIII-D[1] JEROME GUTERL, General Atomics - San Diego — Several experiments have been recently conducted in DIII-D to investigate effects of divertor closure on plasma detachment to improve power dissipation capabilities of tokamak divertors [1]. We present here the modeling and analysis of plasma detachment in closed divertor geometry in DIII-D. Effects of divertor closure on plasma detachment are quantified through the critical ratio of the upstream plasma pressure over the heat flux entering the recycling region which determines the threshold for plasma detachment [2]. To that end, DIII-D boundary plasma are modeled using the 2D boundary plasma transport code UEDGE. ExB drifts have been recently shown to play a critical role in detachment of divertor plasma [3]. Synergistic effects of ExB drifts and divertor closure on plasma detachment are thus examined, taking advantage of the numerical robustness of UEDGE against ExB drifts. In this framework, neutral recycling is modeled with the neutral fluid model embedded in UEDGE to exploit fast convergence of UEDGE simulations permitted by a fully implicit time scheme. The range of applicability of this neutral fluid model in simulations of plasma detachment in DIII-D divertor is estimated using neutral distributions obtained from the kinetic neutral code EIRENE. [1] Guo, H. Y., et al. *Nuclear Fusion* 59.8 (2019): 086054. [2] Pshenov, A. A., et al. *Nuclear Fusion*, *59*(10), 106025 [3] Jaervinen, A. E., et al. *Physical review letters* 121.7 (2018): 075001.

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