Abstract Submitted
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Optimizing target shaping in the DIII-D small angle slot (SAS) divertor to manipulate effects of ExB drifts to improve detachment for both Bt directions.[1] H.Y. GUO, A.W. LEONARD, C. MURPHY, D.M. THOMAS, GA, H.L. DU, SWIP, P.C. STANGEBY, U. Toronto, DIII-D TEAM — A new SAS-V divertor configuration will be explored in DIII-D to optimize detachment for both Bt directions by leveraging the strong synergy between the neutral recycling benefits of the SAS geometry and the effects of ExB drifts. SOLPS-ITER modeling finds that for the favorable Bt direction, ExB drifts can circumvent the benefits of closed divertor configurations by carrying particles out of the closed outer divertor and into the inner divertor. A V-shaped geometry near the outer strike point is found to mitigate this effect by: (a) increasing neutral recycling at the wall of the slot in the private flux region (PFR) due to – and causing – strong radial ExB ion flux from the divertor scrape-off layer to the PFR; (b) decreasing ExB loss of ions out of the outer divertor into the inner divertor via the PFR due to reduction of the radial gradient of electron temperature at the outer target caused by the increased particle retention in the outer divertor. This work points to a promising divertor optimization path to explore for power exhaust in fusion reactors.

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