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Numerical experiments towards the design of an optimized SAS-2 divertor for DIII-D.[1] A. GALLO, R. MAURIZIO, ORAU, G. SINCLAIR, GA, X. MA, ORAU, J. GUTERL, GA, E.T. MEIER, Zap Energy, Inc., L. CASALI, GA, A.E. JAERVINEN, LLNL, A.W. LEONARD, GA, P.C. STANGEBY, University of Toronto, D.M. THOMAS, H.Y. GUO, GA, DIII-D TEAM — Numerical experiments using the SOLPS-ITER code with full drift terms are carried out to guide the design of the next generation Small-Angle Slot (SAS) divertor for the DIII-D tokamak, referred to as SAS-2. Experimental results from DIII-D showed that a SAS divertor can enhance neutral compression as well as energy and momentum dissipation, thereby mitigating the heat load at the divertor target. Recent SOLPS-ITER modeling of the SAS divertor has highlighted the prominent role of ExB drifts in setting particle flux patterns in and out of the slot. New slot geometries are currently being investigated in view of the SAS-2 divertor, with particular interest in V-shaped slots and in-slot pumping for improved local particle control. In this contribution we assess the effect of key design parameters and local plasma conditions on the SAS-2 divertor energy and momentum dissipation performance. Scans of slot angle, slot width, strike point position, pumping speed, heating power, gas puff flow rate and heat flux width are carried out to optimize the SAS-2 divertor design, improving, at the same time, our understanding of the complex physics interplay between slot geometry, magnetic configuration and ExB drifts.

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