Abstract Submitted
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SOLPS modeling of an innovative small-angle slot divertor concept for low-density detachment[1] B. COVELE, General Atomics, C. SANG, Dalian University of Technology, H. GUO, L. LAO, General Atomics, P. STANGEBY, University of Toronto, D. THOMAS, General Atomics — SOLPS modeling offers insight into how a new Small-Angle Slot (SAS) divertor concept exploits the role of neutral trapping to exhaust power and particles at lower core densities than even highly slanted divertors. The special SAS baffling structure enhances volumetric power and momentum losses across the entire target profile, flattening temperatures even in the far SOL. SOLPS characterizes SAS heat and temperature handling for a spectrum of plasma and neutral source conditions, varying $n_{e,sep}$, P_{SOL}, heat flux width, gas puffing rates and locations, and pumping rates. Certain aspects of the baffling structure were also systematically varied to observe the effect on the neutral dynamics, particularly pressure gradients in D_2 near the target. Radial transport coefficients were controlled to match midplane profiles to experimental H-mode profiles. The SAS divertor is an excellent testbed for probing the interplay between plasma and neutrals at the onset of detachment.

[1]The SAS concept is developed under General Atomics corporate funding.

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