

Abstract Submitted
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Numerical exploration of non-axisymmetric divertor closure in the small angle slot (SAS) divertor at DIII-D¹ HEINKE FRERICHS, OLIVER SCHMITZ, Univ of Wisconsin, Madison, BRENT COVELE, HOUYANG GUO, DAVID HILL, General Atomics, YUHE FENG, Max-Planck-Institut fuer Plasmaphysik — In the Small Angle Slot (SAS) divertor in DIII-D, the combination of misaligned slot structure and non-axisymmetric perturbations to the magnetic field causes the strike point to vary radially along the divertor slot and even leave it at some toroidal locations. This effect essentially introduces an opening in the divertor slot from where recycling neutrals can easily escape, and thereby degrade performance of the slot divertor. This effect has been approximated by a finite gap in the divertor baffle. Simulations with EMC3-EIRENE show that a toroidally localized loss of divertor closure can result in non-axisymmetric divertor densities and temperatures. This introduces a density window of 10-15 % on top of the nominal threshold separatrix density during which a non-axisymmetric onset of local detachment occurs, initially leaving the gap and up to 60 deg beyond that still attached. Conversely, the impact of such toroidally localized divertor perturbations on the toroidal symmetry of midplane separatrix conditions is small.

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