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**Experimental Understanding of Heat Flux Dissipation During Plasma Detachment in the Small Angle Slot Divertor of DIII-D**[1] JUN REN, DAVID DONOVAN, University of Tennessee, Knoxville, JON WATKINS, Sandia National Laboratories, HUIQIAN WANG, DAN THOMAS, REJEAN BOIVIN, General Atomics — In DIII-D, an array of surface eroding thermocouples (SETCs) were installed in Small Angle Slot (SAS) divertor to measure the heat flux in a slot-like divertor during detachment. In both toroidal field directions, the peak heat flux measured at the outer strike point was reduced by ˜50% when the plasma reached the detachment regime (obtained by ramping up the plasma density). When the ion Bx$\nabla$B drift direction was toward the SAS divertor, the heat flux measured by SETCs first increased as plasma density increased, then started to roll over when the line-averaged density approached 6x$10^{19}$m$^{-3}$. In contrast, when the ion Bx$\nabla$B drift direction was away from SAS, the heat flux began to decrease at a lower plasma density (˜4x$10^{19}$m$^{-3}$), indicating the onset of plasma detachment, and continued to decrease with further increases of plasma density. These significant differences in the onset of detachment in different $B_T$ directions are believed to be largely determined by the ExB drift. Because ITER's divertor must be operated with some degree of plasma detachment to radiate most of the power arriving in the scrape-off-layer, it is crucial to further understand of the impact of magnetic drifts on plasma detachment behavior.

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