## Abstract Submitted for the DPP19 Meeting of The American Physical Society

Drift effects on W7-X edge heat and particle fluxes<sup>1</sup> KENNETH HAMMOND, Princeton Plasma Physics Laboratory, MARCIN JAKUBOWSKI, CARSTEN KILLER, HOLGER NIEMANN, LUKAS RUDIS-CHHAUSER, MICHAEL ENDLER, YUHE FENG, MATTHIAS OTTE, Max Planck Institute for Plasma Physics, YU GAO, Forschungszentrum Jülich, BOYD BLACKWELL, Australian National University, W7-X TEAM — Classical particle drifts are known to have substantial impacts on fluxes of particles and heat through the edge plasmas in both tokamaks and stellarators, resulting in asymmetric loading of divertor targets. Here we present results from the first dedicated investigation of drift effects in the W7-X stellarator. In low-density plasmas, the main driver of the asymmetries appears to be poloidal  $E \times B$  drift flows due to radial electric fields in the edge plasma, analogous to a similar effect seen in tokamaks. Such flow patterns led to up-down asymmetries in the target fluxes including radial offsets of the strike lines. The explanation of these effects as a consequence of poloidal  $E \times B$  drift flows is supported by a comparison of the locations of the asymmetric features with the footprints of key topological regions of the edge magnetic field on the divertor. In higher-density plasmas, the target fluxes were quite different and the underlying drift mechanisms are not yet as well understood. Also, unlike in the low-density case, the upper and lower targets collected non-ambipolar currents with opposite signs that inverted upon field reversal.

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