# Comparison of experimental and predicted divertor fluxes in W7-X scraper element mimic scenarios

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Experiments were performed in the first diverted operational phase of W7-X (OP1.2a) to mimic the spatial evolution of the divertor strike points that is expected for long-pulse operation in the actively cooled operational phase (OP2). These experiments mimic the evolution of the toroidal current and plasma beta [1] on the edge topology and boundary island size that is predicted to cause overload of the edges of the main divertor components and baffle regions in certain operational scenarios. One proposed solution to this overload problem is the installation of a set of new divertor components known as scraper elements, that intercept the flux to the overloaded divertor edges. Two test divertor scraper elements will be installed before the next operational phase (OP1.2b). The scraper elements are predicted to prevent overload but have the consequences of reducing the pumping efficiency and acting as an additional neutral and impurity source that may deleteriously affect the core plasma. The experiments performed in OP1.2 confirm the predicted scenario and establish the parameters before the installation of scraper elements. Data were obtained in five magnetic configurations, corresponding to five points in the mimicked OP2 current and beta evolution [2]. We focus on comparison of the predicted divertor and baffle heat fluxes to the infrared camera measurements. Initial analysis indicates good qualitative agreement to calculations made using field line diffusion [3] and EMC3-EIRENE, indicated both that rapid diffusion-type calculations are appropriate for approximating divertor fluxes and that the approach of mimicking the effect of otherwise inaccessible plasma parameters such as toroidal current is valid.

[1] J. Geiger, et al., Contrib. Plasma Phys. 50 (2010), 770.

[2] H. Hoelbe, et al, Nucl. Fusion 56 (2016) 025015.

[3] J.D. Lore, et al., IEEE TPS 42, (2014) 539.