

Abstract Submitted
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High-field side scrape-off layer investigation: scaling of the power e-folding width and impurity screening behavior in near-double null configurations¹ B. LABOMBARD, A. KUANG, D. BRUNNER, R. MUMGAARD, J. TERRY, J.W. HUGHES, J. WALK, M. CHILENSKI, Y. LIN, E. MARMAR, G. WALLACE, D. WHYTE, S. WOLFE, S. WUKITCH, MIT PSFC, M. REINKE, ORNL — Fluctuation-induced transport measured on the C-Mod high-field side (HFS) scrape-off layer (SOL) is extremely low; n, T profiles there become very sharp in near-double null configurations and, unlike on the low-field side (LFS), no far SOL “shoulders” are seen. In single-null discharges, this transport asymmetry drives near-sonic parallel flows. A strong impurity screening behavior is also evident – 6x higher N puff rate on the HFS compared to LFS produces the same core N content. It has been proposed that future tokamaks should exploit this remarkable behavior [1] – locate all RF actuators and close-fitting wall structures on the HFS and employ near-double-null topologies, for example. C-Mod is presently investigating this physics more fully: (1) How does the HFS power e-folding width scale with plasma current, $\sim 1/I_p$ as seen for the LFS? (2) Does the favorable screening behavior extend to balanced-double null behavior where the HFS SOL flows become stagnant, or must some unbalance be required? Latest experimental results will be presented.

[1] *ADX: a high field, high power density, advanced divertor and RF tokamak*, Nucl. Fusion **55** (2015) 053020.

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