

Abstract Submitted
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Sorting Category: 5.1.1.2 (Experimental)

**Measurement of Current in Scrape-off Layer (SOL)
Plasma in the DIII-D Tokamak¹**

H. TAKAHASHI, E.D. FREDRICKSON, Princeton Univ., M.J. SCHAFFER, T.E. EVANS, L.L. LAO, General Atomics — This work is motivated by a hypothesis based on experimental observations in the TFTR tokamak (H. Takahashi *et al.*, APS DPP, 1998, K6Q.07) that a SOL current exists that magnetically mimics MHD phenomena, *e.g.*, Stationary Magnetic Perturbations (SMPs) or locked modes. “Base” SOL current can be several times as large as previously reported, increases during Resistive Wall Modes, and is often not axisymmetric, contrary to a common assumption. “Spiky” current, coincidental with Edge Localized Modes (ELMs), is also often not axisymmetric. Current that oscillates like MHD modes has also been observed. Spiky or oscillating SOL current can be bi-polar, quickly reversing its flow direction. The lack of axisymmetry and bi-polar nature of observed current challenge theoretical explanations of the origin of SOL current. The SOL current, which is measured in DIII-D using its tile current monitor diagnostic, will be examined as “edge current” in equilibrium and stability, and as a provider of “field errors” for slowing down and locking of MHD modes.

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- Prefer Oral Session
 Prefer Poster Session

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Special instructions: DIII-D Poster Session 1, immediately following EA Lazarus

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