

Abstract Submitted
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Scrape-off-layer currents during MHD activity and disruptions in HBT-EP¹ J.P. LEVESQUE, S. DESANTO, A. BATTEY, J. BIALEK, J.W. BROOKS, M.E. MAUEL, G.A. NAVRATIL, Columbia University — We report scrape-off layer (SOL) current measurements during MHD mode activity and disruptions in the HBT-EP tokamak[1]. Currents are measured via Rogowski coils mounted on tiles in the low-field-side SOL, toroidal jumpers between otherwise-isolated vessel sections, and segmented plasma current Rogowski coils. These currents strongly depend on the plasma's major radius, mode amplitude, and mode phase. Plasma current asymmetries and SOL currents during disruptions reach 4% of the plasma current. Asymmetric toroidal currents between vessel sections rotate at tens of kHz through most of the current quench, then symmetrize once I_p reaches 30% of its pre-disruptive value. Toroidal jumper currents oscillate between co- and counter- I_p , with co- I_p being dominant on average during disruptions. Increases in local plasma current correlate with counter- I_p current in the nearest toroidal jumper. Measurements are interpreted in the context of two models that produce contrary predictions for the toroidal vessel current polarity during disruptions. Plasma current asymmetries are consistent with both models, and scale with plasma displacement toward the wall. Progress of ongoing SOL current diagnostic upgrades is also presented. [1] J.P. Levesque et al 2017 Nucl. Fusion 57 086035

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