

Abstract Submitted
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Scrape-off layer current measurements on HBT-EP¹ M.C. ABLER, J.P. LEVESQUE, J.W. BROOKS, J. BIALEK, M.E. MAUEL, G.A. NAVRATIL, Columbia University — Scrape-off layer currents flowing between the plasma and the wall are a topic of interest in the fusion community due to possible ramifications for the operation of the ITER tokamak and future magnetic confinement devices. HBT-EP, with four toroidally-distributed poloidal quartz breaks in the vacuum vessel, is uniquely positioned to study scrape-off layer currents as they flow toroidally between chamber sections. We study these currents during natural kink mode activity, applied RMPs, and disruptions using a set of copper straps between otherwise-isolated chamber segments and two toroidally-opposite segmented Rogowski coils. Both diagnostic sets detect currents which evolve dynamically with MHD activity, show an order of magnitude increase in vacuum vessel currents during disruptions, and demonstrate current flow between the vacuum vessel and the plasma scrape-off layer. We also describe new in-vessel diagnostics for high-resolution scrape-off layer current measurement and discuss planned experiments as part of our ongoing upgrade.

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