

Abstract Submitted
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Control of scrape-off layer currents in HBT-EP using biased electrodes¹ J.W. BROOKS, M.C. ABLER, J. BIALEK, J.P. LEVESQUE, M.E. MAUEL, G.A. NAVRATIL, Columbia Univ — Scrape-off layer (SOL) currents and their paths through tokamaks are not well understood, but their control may prove crucial to the success of ITER and future fusion energy devices. We extend Columbia University High Beta Tokamak-Extended Pulse's (HBT-EP) diagnostics and feedback system to study the SOL and control MHD instabilities - typically around 7 kHz - by actively controlling these currents. We conduct these experiments in two phases: first with a single probe, then with multiple, independent probes. With a single probe, we have shown that active feedback alters the rotation and magnitude of slowly growing kink instabilities. Present work focuses on multiple probes in both a net-zero current configuration and independent configurations with an active GPU feedback system to control the magnitude and phase of MHD instabilities. In addition to the biased electrodes, two triple-probes are placed in the SOL to help us better-understand SOL density and temperature. This research also provides insight into the next phase of research, a multi-element SOL control upgrade of HBT-EP currently underway.

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