

Abstract Submitted  
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**Scrape-off-layer characterization and current-control of kink modes in HBT-EP**<sup>1</sup> JOHN BROOKS, IAN STEWART, JEFFREY LEVESQUE, MIKE MAUEL, GERALD 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's High Beta Tokamak-Extended Pulse (HBT-EP) experiment [1] and active GPU feedback system [2] to study the SOL and control MHD kink instabilities by actively controlling these currents. First, the radial plasma profiles and the edge structure of kink instabilities are measured with two triple probes. Second, we use active feedback control of a radially adjustable biased electrode to change the rotation and magnitude of slowly growing kink instabilities. By changing the phase between the probe's voltage and the edge instability with active feedback, we study its ability to influence and control plasma MHD structures. This work is in preparation for a planned 2018 multi-electrode SOL control upgrade. 1. J.P. Levesque, et al., Phys Plasmas 22, 056102 (2015). 2. N. Rath, et al., Rev Sci Instrum 85, 045114 (2014).

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John Brooks  
Columbia Univ

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