

Abstract Submitted
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Scrape-off-layer current and EUV diagnostics and control on the HBT-EP tokamak¹ J.P. LEVESQUE, M.E. MAUEL, J. BIALEK, G.A. NAVRATIL, Columbia University, L. DELGADO-APARICIO, Princeton Plasma Physics Laboratory, C.J. HANSEN, University of Washington — Non-axisymmetric currents in the scrape-off-layer (SOL) and conducting structure of a tokamak can produce severe forces at high plasma performance, compromising the device's structural integrity. Diagnosing these currents during disruptions is important for extrapolating forces in future machines including ITER. Progress on designing components to measure and control SOL and vessel currents in the HBT-EP tokamak is presented. Movable tiles positioned around limiting surfaces will measure SOL and vessel currents during mode activity and disruptions. Biasable plates at divertor strike points will allow control of field-aligned SOL currents for kink mode control studies and will drive convection in the plasma edge. In-vessel Rogowski coils will measure currents in wall components with high spatial resolution. A planned EUV diagnostic upgrade is also presented. Four sets of 16 poloidal views will allow tomographic reconstruction of plasma emissivity and internal kink mode structure. A separate two-color, 16-chord tangential system will allow reconstruction of temperature profiles versus time. Measurements will be input to HBT-EP's GPU-based feedback system, providing active feedback for kink modes using only optical sensors and both magnetic and edge current actuators.

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