

Abstract Submitted  
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**Design and Construction of New HBT-EP Passive Wall, Control and Sensor Coil System for Kink Rigidity Studies** D.A. MAURER, B. DEBONO, J.P. LEVESQUE, M.E. MAUEL, G.A. NAVRATIL, T.S. PEDERSEN, N. RATH, D. SHIRAKI, Columbia University — An important plasma response issue is to quantify the extent to which one can perform feedback on one unstable mode without destabilizing other stable MHD modes when they approach marginal stability as the plasma pressure is increased near the ideal wall limit. The HBT-EP experiment is investigating this effect of non-rigid, multimode plasma response during feedback control of the external kink using a new passive stabilizing wall geometry and new set of 120 modular feedback coils of varying toroidal angular coverage. Plasma multimode magnetic response will be measured and quantified using new pickup coil arrays containing 216 poloidal and radial magnetic sensors. This new passive wall-feedback coil system will allow the first detailed measurement of multi-mode, non-rigid kink mode response, first investigation of multi-mode feedback control of the kink mode, and allow the development of feedback strategies to mitigate sideband coupling to stable plasma modes thus limiting plasma non-rigid response and increasing feedback effectiveness. Design, construction, and installation details of the new wall and coil sets will be presented and discussed. Supported by U.S. DOE Grant DE-FG02-86ER53222.

David Maurer  
Columbia University

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