

Abstract Submitted  
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**Multimode MHD Stability Investigations using Plasma Shaping on HBT-EP** P. BYRNE, D. SHIRAKI, J.P. LEVESQUE, D.A. MAURER, M.E. MAUEL, N. RATH, Columbia University Plasma Physics Lab — We describe the design and installation of a “zero net turns” shaping coil that will allow the systematic investigation of plasma shaping. This coil will permit formation of a diverted plasma and the study of MHD characteristics such as multimode plasma response and stability in a shaped plasma in HBT-EP for the first time. The design, and construction of a capacitive power source is also discussed. Using HBT-EP’s 40 element control coil set, computational studies into the multimode response of a shaped plasma to resonant magnetic perturbations (RMP’s), are undertaken. The effects of the RMP’s on a shaped plasma have been simulated using the TokaMac and Valen codes. In addition, the control coils allow for great flexibility in perturbing the equilibrium flux surfaces with high resolution. These coilsets have been used to increase the squareness of the plasma via  $n=0$ ,  $m=3$  shaping on the low field side, as a preliminary investigation into the effects of shaping on MHD activity. Supported by US DOE Grant: DE-FG02-86ER53222.

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