

Abstract Submitted  
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**Design of the HBT-EP Shaping Coil**<sup>1</sup> P.J. BYRNE, N. RATH, J.P. LEVESQUE, D. SHIRAKI, D.A. MAURER, M.E. MAUEL, G.A. NAVRATIL, Columbia University — The kink-mode instability is closely linked to the helicity of field lines in a toroidal plasma. Modifying this helicity will permit a new method of MHD multimode control on HBT-EP. HBT-EP's control coil system has allowed us to run preliminary low power shaping shots. Clear effects have been seen on the 3/1 mode despite the lower power and non-axisymmetry of the control coil system vs. the shaping coil as designed. The HBT-EP Shaping Coil will allow local, axisymmetric shaping of the toroidal flux surfaces up to and including the creation of a single poloidal field null, allowing fully diverted operation in HBT-EP for the first time. The coil will allow the investigation of the effects on multimode stability of a toroidal plasma due to flux surface shaping. Despite running with a poloidal field null, the plasma will maintain positional stability without the aid of active feedback. The finalized design of the capacitor power bank is also discussed.

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