

Abstract Submitted
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Equilibrium Reconstruction and Ideal Stability Analysis of HBT-EP plasmas N. RATH, B. DEBONO, J.P. LEVESQUE, M.E. MAUEL, D.A. MAURER, G.A. NAVRATIL, T.S. PEDERSEN, D. SHIRAKI, Columbia University — Accurate knowledge of the safety factor profile is needed to evaluate MHD stability for resistive wall kink modes. In HBT-EP, we reconstruct the time evolution of the safety factor profile with the Tokamac code from equilibrium measurements of external magnetic fields and fluxes along with equilibrium coil currents. Additionally, internal magnetic field information is measured using movable edge magnetic probes to constrain the profile reconstruction. Recent installation of a new passive stabilizing wall for multimode kink studies has substantially increased the magnetic diagnostic measurement set available. Incorporation of this enhanced magnetic capability into the Tokamac code will be described. Eddy currents can have a large effect on the equilibrium of HBT-EP plasmas due to the new close fitting conducting wall used to stabilize the ideal kink. Eddy-currents in these wall segments will be modeled as a superposition of pre-calculated current eigenmodes whose weights are included in the equilibrium fitting procedure. Direct measurement of the eddy-currents from a known toroidal source current will be used to verify the eddy-current model. Ideal stability analysis of these equilibria using the DCON code will also be presented for a series of reconstructed equilibria. Supported by U.S. DOE Grant DE-FG02-86ER53222.

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