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Ongoing Ferritic Wall Mode studies on HBT-EP[1] P.E. HUGHES, M.E. MAUEL, J.P. LEVESQUE, G.A. NAVRATIL, Columbia Univ — Low-activation ferritic steels are leading material candidates for use in next-generation fusion development experiments such as a prospective US component test facility and DEMO [1]. Understanding the interaction of plasmas with a ferromagnetic wall will provide crucial physics for these experiments. Although the ferritic wall mode (FWM) was seen in a linear machine [2], ferritic steel was observed to be compatible with high-performance operation in JFT-2M [3]. Using its high-resolution magnetic diagnostics and adjustable wall segments, HBT-EP now operates successfully with a high-permeability tiled ferritic first wall. Initial measurements showed the ferritic wall enhances the growth rate of the m/n = 3/1 kink mode [4]. In this poster, we report results of our study of the evolution of naturally rotating modes, increased plasma response to phase-flip resonant magnetic perturbations (RMPs), and enhanced plasma disruptivity as the walls are adjusted from stainless wall to ferritic wall configuration.

[1] Kurtz, R.J., et. al. J Nucl Mater 386-388 (2009)
[2] Bergerson, W., et. al. Phys Rev Lett 101 (2008)
[3] Tsuzuki, K., et. al. Nucl Fus 46 (2006)
[4] Levesque, J., et al. Phys. Plasmas 22, 056102 (2015)

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