Ferritic wall studies on HBT-EP\(^1\) PAUL E. HUGHES, J.P. LEVESQUE, M.E. MAUEL, G.A. NAVRATIL, Columbia Univ — Low-activation ferritic steels are leading material candidates for use in next-generation fusion development experiments such as ITER and DEMO. Understanding the interaction of plasmas with a ferromagnetic wall will provide crucial physics for these experiments. Although the ferritic wall mode (FWM) was not observed in JFT-2M \([1]\), it has been been studied in HBT-EP \([2]\), while the effects of related error fields have been studied on DIII-D \([3]\). HBT-EP operates with a high-permeability tiled ferritic first wall, characterizing its MHD effects using high-resolution magnetic diagnostics. We report on our study of FWM dynamics comparing stainless and ferritic wall configurations, including increases in plasma response to RMPs, plasma disruptivity, and natural mode growth \([2,4]\); new results include differences in scrape-off layer (SOL) current dynamics and mode rotation frequency dependence of the FWM growth rate \([4]\). Additionally, we present the effects of toroidally asymmetric distribution of ferromagnetic material on mode rotation.

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