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Non-Ideal Error-Field Response Model with a Ferritic and Resistive Wall[1] DOV RHODES, A.J. COLE, G.A. NAVRATIL, J.P. LEVESQUE, M.E. MAUEL, Columbia University, R. FITZPATRICK, University of Texas at Austin
— A sharp boundary MHD model including non-ideal tearing layer physics [1] has been extended to include an up-down asymmetric equilibrium, with resistive and ferritic wall boundary conditions in the vacuum region outside the plasma. The model is designed to explore two related problems in strongly shaped geometry: the intrinsic stability limit of a resistive plasma in the presence of a resistive and/or ferritic wall, and the response of the plasma to error-fields near marginal stability. Presented results include an extension of the recent cylindrical 4-beta calculations of Brennan and Finn [2] to shaped toroidal equilibrium, and the response to error-fields near each beta limit. Future applications include the study of multi-mode feedback control, verification with larger codes such as NIMROD, PEST3, and VALEN, and comparison with recent ferritic wall experiments at HBT-EP [3].

[1] R. Fitzpatrick, Phys. Plasmas 17, 112502 (2010).
[2] D. P. Brennan and J. M. Finn, Phys. Plasmas 21, 102507 (2014).
[3] J.P. Levesque et. al., Phys. Plasmas 22, 056102 (2015).

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