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Extended MHD modeling of edge-localized mode suppression by three-dimensional magnetic perturbations in KSTAR G.Y. PARK, J. KIM, National Fusion Research Institute, T.E. EVANS, B.C. LYONS, General Atomics, D.M. ORLOV, University of California San Diego, N.M. FERRARO, Princeton Plasma Physics Labaratory, Y. IN, M.J. CHOI, S.W. YOON, National Fusion Research Institute — In this presentation, we report on numerical calculations of the linear response of a plasma to applied three-dimensional magnetic perturbations (MPs) in KSTAR. Simulations are implemented using the extended MHD code M3D-C1 [1]. Initial M3D-C1 calculation of the plasma response in KSTAR [2] has already produced results that are qualitatively consistent with some experimental characteristics observed during the application of MPs in KSTAR, i.e., amplified kink response and associated plasma displacements. Both of the tearing and kink responses are considered and used to explain the basic experimental characteristics of the suppression of edge-localized modes (ELMs) in KSTAR, i.e., q95, heating, and plasma shape dependences of the suppression. In particular, attention is focused on validation studies comparing the M3D-C1 plasma response results to the magnetic and imaging diagnostic measurements (i.e., ECEI data) in KSTAR. In addition, comparison study of the M3D-C1 results with KSTAR and DIII-D data will be presented to help understand a common ELM suppression mechanism which is expected to hold across the different tokamaks. [1] N. M. Ferraro, Phys. Plasmas **19**(5), 056105 (2012) [2] D. M. Orlov *et al.*, Plasma Phys. Control. Fusion **58**, 075009 (2016)

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