Abstract Submitted
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Kinetic equilibrium reconstruction, ideal and resistive stability analyses supporting Disruption Event Characterization and Forecasting on KSTAR* Y. JIANG, S.A. SABBAGH, Y.S. PARK, J.W. BERKERY, J.H. AHN, J.D. RIQUEZES, Columbia U., J. KO, J.H. LEE, S.W. YOON, NFRI, A.H. GLASSER, Fusion Theory and Computation, Z. WANG, PPPL — Disruption prediction and avoidance are critical research elements for modern superconducting tokamak devices such as Korea Superconducting Tokamak Advanced Research (KSTAR) facility to reliably sustain long pulse and high performance plasmas. High fidelity equilibrium reconstruction is an essential requirement for accurate determination of the plasma stability and disruption prediction analyses to support the goal of continuous, disruption-free operation. Kinetic equilibrium reconstructions with excellent convergence error (from 10^{-10} to 10^{-13}) are generated by using Thomson scattering, charge exchange spectroscopy data, motional Stark effect data, and all available magnetic sensors, in addition of vacuum vessel and passive plate currents following an approach used in NSTX [1]. Ideal global magnetohydrodynamic (MHD) and resistive MHD stability are studied for KSTAR plasmas to provide input to plasma disruption forecasting analysis, with the Resistive DCON code being used for these studies. Time-evolving stability analysis comparing mode activity and rational surface evolution shows the possible relation between key surfaces such as $q = 2$ and observed plasma modes. *Supported by U.S. DOE Grant DE-SC0016614.
[1] S.A. Sabbagh, A.C. Sontag, J.M. Bialek, et al., Nucl. Fusion 46 (2006) 635.

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