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Reconstruction of Plasma Equilibria and Projected Stabilization of Global MHD Modes in KSTAR[1] Y.S. PARK, S.A. SABBAGH, J.M. BIALEK, J.W. BERKERY, Columbia U., Y.M. JEON, S.H. HAHN, S.G. LEE, K-.I. YOU, NFRI, Korea, H.K. PARK, POSTECH, Korea, T.E. EVANS, N. EIDIETIS, M. WALKER, J. LEUER, General Atomics — Experimental equilibria of the KSTAR tokamak with plasma current up to 0.34 MA were reconstructed using EFIT. Vessel currents were included by fitting estimated values based on loop voltage measurements and effective resistances from 2 and 3-D vacuum model calculations including a double-walled vessel with large port penetrations and passive stabilizers. Active and passive stabilization of global MHD instabilities for operation above the no-wall beta limit is also projected. The stabilization is applied using a set of segmented internal coils called in-vessel control coils (IVCCs). Passive stability of the resistive wall mode and power requirement for its active stabilization are investigated including conductive casing structures covering the IVCC, and noise effects. The potential for ELM mitigation by resonant magnetic perturbations is also examined by using the TRIP3D code. Favorable configurations of the IVCC based on the Chirikov parameter are determined using a combination of all IVCCs (midplane and off-midplane coils) with a dominant n = 2 field configuration.

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Young-Seok Park
Columbia University

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