Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

MHD-consistent Kinetic XGC0 study of 3D RMP effect on edge pedestal transport GUNYOUNG PARK, H. STRAUSS, C.S. CHANG, S. KU, New York University, J-K PARK, PPPL — Experiments have shown that the resonant magnetic perturbations (RMPs) applied by an external coil array can control edge localized modes (ELMs) in an H-mode pedestal. The externally applied 3D magnetic field perturbations could be significantly modified by the plasma response, which include RMP screening, RMP amplification, and convective cell formation. In this work, kinetic XGC0 simulation of RMP transport is performed using an MHD-evaluated 3D RMP perturbation in the plasma, either the ideal MHD response from the IPEC code or the resistive MHD response from the M3D code. In the case of the resistive MHD response, plasma rotation profile (as well as the density and temperature profiles) in XGC0 is coupled with the RMP penetration in M3D for a more self-consistent screening of the external RMPs and the convective cell formation in a real geometry edge plasma. Difference in the kinetic pedestal behaviors between the ideal and resistive MHD RMP responses will be reported. Experimental validation will be performed in DIII-D and NSTX plasmas.

Gunyoung Park
New York University

Date submitted: 18 Jul 2008 Electronic form version 1.4