Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Effect of RMP spectrum on ELM suppression and the divertor plasma in KSTAR JOON-WOOK AHN, Oak Ridge National Laboratory, J.-K. PARK, Princeton Plasma Physics Laboratory, Y. IN, National Fusion Research Institute, A. LOARTE, ITER Organization, J. KIM, Y.M. JEON, G.Y. PARK, National Fusion Research Institute, W. CHOE, J.H. HONG, Korea Advanced Institute of Science and Technology, S.H. HONG, H.H. LEE, C.S. KANG, W.H. KO, S.W. YOON, National Fusion Research Institute — ELM suppression by n=1 and n=2 magnetic perturbations have been robustly obtained in KSTAR, and effects of various coil configurations for applied magnetic perturbations (MPs) on ELM suppression as well as divertor plasma conditions have been investigated. The 4 toroidal and 3 poloidal sectors of internal coils allow to fully scan the phase difference ($\Delta\varphi$) of n=1 between different rows of coils, where it is shown that ideal plasma response can either shield or amplify applied MPs, depending on $\Delta\varphi$, which leads respectively to the weakening and strengthening of divertor footprint striations compared to the vacuum case. On the other hand, shielding is found to be the dominant plasma response for all possible cases of n=2 configuration ($\Delta\varphi$ =0^o and 90^o, and mid-plane coil only), which weakens footprint striations. Spectra of applied MPs have been varied by changing $\Delta\varphi$ as well as modifying the ratio of coil currents between different row of coils, e.g. I_U/I_L, in order to find optimal conditions for ELM suppression and divertor heat and particle flux dispersal. Effects of divertor conditions in various density and impurity levels on the ELM behavior and footprint striations are also being investigated. Work supported by the U.S. DOE, contract # DE-AC05-00OR22725.

Joon-Wook Ahn
Oak Ridge National Laboratory

Date submitted: 15 Jul 2016 Electronic form version 1.4