Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

**Numerical Simulation on Applicability of Resonant Magnetic Perturbation to KSTAR Tokamak** DOOHYUN KIM, HYUNSUN HAN, KI MIN KIM, SANG HEE HONG, Department of Nuclear Engineering, Seoul National University, FUSION AND PLASMA APPLICATION LABORATORY TEAM — A numerical simulation is carried out to investigate the perturbed magnetic field configurations for a feasibility study on the resonant magnetic perturbation(RMP) to mitigate ELM damages to the divertor in KSTAR tokamak. The perturbed magnetic fields are described by vacuum superposition of equilibrium fields and fluctuating fields induced from the in- vessel control coils (IVCCs) will be installed in KSTAR. The equilibrium and induced fields are calculated using Grad- Shafranov equation and Biot-Savart law, respectively. For visualizing the magnetic field configurations, a field line tracing code has been developed using the 4th-order Runge-Kutta method. Magnetic field perturbations and island configurations can be found with this tracing code by describing poloidal positions of field lines as the increment of toroidal angle. And the Chirikov parameter is calculated to verify the generation of stochastic layer by overlap of magnetic islands. From this numerical work, it is confirmed that stochastic magnetic field lines are formed when the IVCC magnetic fields are generated, and the effect of RMP on KSTAR operation is discussed.

Doohyun Kim
Department of Nuclear Engineering, Seoul National University

Date submitted: 06 Jul 2009 Electronic form version 1.4