Abstract Submitted
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Computational Analysis of Heat Deposition Pattern Dependence on RMP Phasing for KSTAR[1] JONATHAN VAN BLARCUM, HEINKE FRERICHS, OLIVER SCHMITZ, University of Wisconsin - Madison, JONG-KYU PARK, SEONGMOO YANG, Princeton Plasma Physics Laboratory — Resonant Magnetic Perturbations (RMP) will be used on ITER in the effort of suppressing Edge Localized Modes (ELM). A predictive model for ELM control was validated on the Korean Superconducting Tokamak for Advanced Research (KSTAR) defining a 'window' of RMP configurations that offer suppression, [J.-K. Park et al., Nature Physics 14 (2018)]. This work explores variation of the power deposition onto diverter targets relative to RMP phasing throughout the ELM suppression window. A magnetic footprint analysis was performed using Field Line Analysis and Reconstruction Environment (FLARE) which showed significant variation in the diverter's connection to inner plasma regions relative to RMP phasing, suggesting similar variation in the associated heat deposition. EMC3-EIRENE, a Monte Carlo fluid plasma edge model, is then used to model the heat and particle loads on the diverter, including effects from plasma response, modeled by Generalized Perturbed Equilibrium Code (GPEC). In this way the variation of the diverter heat flux due to RMP phasing along the KSTAR ELM suppression window is computationally determined and a minimal heat flux RMP configuration is predicted.

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