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Two-Dimensional Simulation of Edge Localized Modes in the Edge-SOL Region of the KSTAR Tokamak[1] KI MIN KIM, HYUN-SUN HAN, SANG HEE HONG, Seoul National University — H-mode plasmas in the tokamak are frequently perturbed by oscillating instabilities known as ELMs (Edge Localized Modes) in the edge-SOL (Scrape-Off Layer) region. Large losses of plasma particle and energy by ELMs have a critical influence on the degradation of plasma confinement, and the released energies can cause serious damages to the plasma facing components in the edge region. In order to investigate the effects of ELMs on the tokamak operation, a two-dimensional predictive simulation has been carried out for the KSTAR (Korea Superconducting Tokamak Advanced Research) tokamak by the B2 transport code. Double-null edge-SOL geometry and reference ELMy H-mode scenarios of KSTAR are considered, and the enhanced transports during an ELM period are reproduced with the modified transport coefficients at the edge. The duration and frequency of ELMs are varied to simulate type-I and type-III ELMs. Simulation results show the dynamics of the plasma properties focused on the heat fluxes on the divertor target during ELMs. In addition, parametric characteristics of the divertor heat load distributions are discussed.

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