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Kinetic simulations of divertor heat load profile and dependence on plasma current and heating power JULIAN CUMMINGS, California Institute of Technology, C.S. CHANG, GUNYOUNG PARK, New York University, ALEXEI PANKIN, Lehigh University, CPES TEAM — One performance target for the DOE Office of Fusion Energy Sciences this year is to improve understanding of heat transport in the tokamak scrape-off layer plasma and divertor conditions in ITER. Divertor heat flux and edge plasma profiles have been measured in multiple tokamak devices for H-mode discharges with similar dimensionless plasma parameters and scans over plasma current and heating power. For this FY 2010 Joint Research Target milestone, the Center for Plasma Edge Simulation has performed kinetic simulations of the edge region for a subset of these discharges using the discrete guiding-center neoclassical transport code XGC0. This code includes realistic X-point geometry, a neutrals source model and collisions, and a diffusion model for turbulent transport. Plasma particles are initialized with measured density and temperature profiles. Particle and heat load data is collected on the inner and outer divertor plates. In this presentation, we compare heat load estimates for DIII-D, NSTX and Alcator C-Mod similarity discharges and show the trends with varying plasma current and heating power.

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