Abstract Submitted
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Drift effects on the tokamak power scrape-off width[1] E.T. MEIER, William and Mary, R.J. GOLDSTON, Princeton Plasma Physics Laboratory, E.G. KAVEEVA, St. Petersburg Polytechnic University, S. MORDIJCK, William and Mary, V.A. ROZHANSKY, I. YU. SENICHENKOV, S.P. VOSKOBOYNIKOV, St. Petersburg Polytechnic University — Recent experimental analysis suggests that the scrape-off layer (SOL) heat flux width (λ_q) for ITER will be near 1 mm, sharply narrowing the planned operating window. In this work, motivated by the heuristic drift (HD) model, which predicts the observed inverse plasma current scaling, SOLPS-ITER is used to explore drift effects on λ_q. Modeling focuses on an H-mode DIII-D discharge. In initial results, target recycling is set to 90%, resulting in sheath-limited SOL conditions. SOL particle diffusivity (D_{SOL}) is varied from 0.1 to 1 m^2/s. When drifts are included, λ_q is insensitive to D_{SOL}, consistent with the HD model, with λ_q near 3 mm; in no-drift cases, λ_q varies from 2 to 5 mm. Drift effects depress near-separatrix potential, generating a channel of strong electron heat convection that is insensitive to D_{SOL}. Sensitivities to thermal diffusivities, plasma current, toroidal magnetic field, and device size are also assessed. These initial results will be discussed in detail, and progress toward modeling experimentally relevant high-recycling conditions will be reported.

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