Abstract Submitted
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Divertor heat-load width from gyrokinetic neoclassical and turbulence simulation in XGC1[1] SEUNG-HOE KU, ROBERT HAGER, C.S. CHANG, JIANYING LANG, D.P. STOTLER, Princeton Plasma Physics Laboratory, EPSI TEAM — Divertor heat-load width is one of the critical issues for magnetic fusion and ITER. For a more complete first-principles study of the problem, XGC1 gyrokinetic simulation is performed in diverted geometry including neutral particles, gyrokinetic ions, and drift-kinetic electrons. Neoclassical, X-transport (orbit loss), spontaneous radial and poloidal electric field generation, and turbulence bob physics are solved together. A stable logical sheath algorithm is used for the determination of wall sheath potential, without the actual resolution of the Debye sheath profile. The contributions of various physics elements to the divertor heat-load width are investigated: baseline neoclassical physics, blobs, neutral particles, and 3D RMP. DIII-D, NSTX, C-Mod, and JET geometry will be compared. Comparison with the drift-based model for heat-load width [1] and the purely neoclassical XGC0 result [2] and comparison with experimental observations will also be presented.

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