Abstract Submitted
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Towards understanding the role of turbulence on scaling of divertor heat flux profile widths on DIII-D[1] T.F. TANG, Dalian University of Technology, X.Q. XU, LLNL, T.Y. XIA, ASIPP, M. MAKOWSKI, C. LASNIER, LLNL, T. LEONARD, T.H. OSBORNE , GA, J.Z. SUN, D.Z. WANG, Dalian University of Technology — Recent multi-machines scaling law of parallel heat flux width proportional to the inverse of plasma current. Theoretical models, such as Critical gradient models can match the experiment at certain points, however, the role of the neoclassical transport and the turbulence transport, on the heat flux remain uncertain. We have used BOUT++ 6-field 2-fluid module to analyze the nonlinear turbulent transport of three H-mode discharges from DIII-D. With the evolution of the plasma profiles, the heat flux amplitude is greater and the heat flux width is broader, comparing to the experimental results. The curvature drift and neoclassical transport contribution on the heat flux is estimated, which shows the heat flux is mainly carried by the turbulence transport. The simulation also shows the electron heat flux, saturated at the divertor target, is much larger than the ion heat flux. While the cases without evolution inside the separatrix gives a smaller heat flux amplitude and narrower width, comparable to the experimental results. To eliminate the uncertainty of the simulation, time averaged simulation results of the heat flux at different time windows are also given.

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