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Baseline neoclassical scaling law on H-mode pedestal width from XGC0 kinetic simulation[1] GUNYOUNG PARK, C.S. CHANG, S. KU, NYU, CPES TEAM — In the H-mode pedestal before the ELM onset, nonlocal neoclassical self-organization is an important physical effect, to set the baseline pedestal width scaling law. Deviation from the neoclassical scaling will define the anomalous scaling. The neoclassical self-organization includes effects from the self-consistent radial electric field shear, strong magnetic field shear, ion-orbit loss across the last closed magnetic surface, finite ion banana width, particle source from neutral ionization, heat flux from the core plasma, and collisional transport. XGC0 code is used to perform an inter-machine study of the neoclassical pedestal scaling law between two representative devices DIII-D (low-B, low collisionality) and C- Mod (high-B, high collisionality). Anomalous scaling component in the experimental pedestal width data will be separated out from the neoclassical component. Prediction for ITER pedestal will be attempted based upon the combined neoclassical (theoretical) and anomalous (empirical) scaling laws obtained in this study. This ion-electron study indicates that the neoclassical pedestal width is broader than the previous ion only study results, closer to experimental pedestal width.

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