Abstract Submitted
for the DPP98 Meeting of
The American Physical Society

Sorting Category: 5.1.1.2 (experimental)

Evolution of Main Ion Poloidal Rotation and Pressure Gradient Across H–mode Transition[1] R.J. GROEBNER, K.H. BURRELL, General Atomics, J. KIM, Korea Basic Science Institute — Past studies in DIII–D are consistent with the hypothesis that increasing shear in the edge radial electric field E_r causes the H–mode transition. These studies indicate that changes in the edge main ion perpendicular rotation v_{perp} initiate changes in E_r which cause the transition and that subsequent changes in the edge main ion pressure gradient ∇P lock in the edge E_r in the H–mode. These mechanisms are being examined with direct measurements of the main ion poloidal and toroidal rotation (v_{pol} and v_{tor}) and ∇P at the edge of a helium plasma. At a temporal resolution of approximately 5 ms, no significant change is seen in the main ion v_{pol} or v_{perp} across the transition. However, this time resolution is not sufficient to view rapid transient changes in v_{pol}, which have been suggested by theoretical models. The main ion pressure gradient shows a substantial increase across the H–mode transition and provides the dominant contribution to the negative edge E_r in H-mode. These results are consistent with the previous picture of the H-mode dynamics obtained on DIII–D.

[1]Work supported by U.S. DOE Contract DE-AC03-89ER51114.

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☐ Prefer Oral Session
☒ Prefer Poster Session

Special instructions: DIII–D Poster Session I (transport, turbulence, & stability), immediately following Petrie

Date submitted: July 22, 1998 Electronic form version 1.3