DPP09-2009-001636

Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Sorting Category: 5.6.4 (E)

Edge current and pressure measurements of plasma equilibrium and stability properties in PEGASUS[1] E.T. HINSON, M.W. BONGARD, R.J. FONCK, B.A. KUJAK-FORD, B.T. LEWICKI, A.J. REDD, G.R. WINZ, University of Wisconsin-Madison — The plasma edge region in the PEGASUS ST exhibits a range of fluctuation phenomena, from peeling-like modes at high $\dot{I}_p$, to standard broadband electrostatic turbulence. Measurements of the edge region will support studies of its equilibrium and stability properties, and provide information for RF coupling (HHFW and EBW) for future heating and current drive studies. Langmuir probes are used to measure the edge pressure gradient with high temporal resolution. Together with measurements of the edge B_z profile from a radial array of Hall probes, the derived $p(r)$ and $j_\parallel(r)$ profiles will support detailed edge stability analyses. Peeling-like modes manifest as edge filamentary structures commonly observed in Ohmic discharges. Scanning Mirnov probes indicate broadband magnetic turbulence when this filamentation occurs. Peeling-mode theory predicts instability for large $\langle j_\parallel/B\rangle$, a condition that PEGASUS may satisfy ($B_t \sim 0.1$ T, $j_\parallel \sim 0.1$ MA/m^2). These measurements will enable determination of $\langle j_\parallel/B\rangle$ and $p(r)$ at $r \approx a$, and offer unique tests of peeling-ballooning theory. Future studies will employ divertors to increase magnetic shear and influence edge turbulence.

[1]Supported by U.S. D.O.E. Grant DE-FG02-96ER54375.

Michael Bongard
mbongard@wisc.edu
University of Wisconsin-Madison

☐ Prefer Oral Session
☒ Prefer Poster Session

Special instructions: Please place with other Pegasus posters as Pegasus poster 3.

Date submitted: 17 Jul 2009 Electronic form version 1.4