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H-mode Edge Turbulence and Pedestal Measurements in Pegasus Plasmas using Langmuir Probes[1] D.M. KRIETE, G.M. BODNER, M.W. BONGARD, R.J. FONCK, K.E. THOME, D.S. THOMPSON, University of Wisconsin–Madison — In Pegasus discharges, L-H mode transitions are induced using Ohmic heating and high-field-side fueling. H-mode plasmas have energy confinement consistent with the ITER98pb(y,2) scaling law, indications of increased electron and ion temperature, and an increase in core rotation compared to L-mode plasmas. Electron density and temperature profiles have been measured in the edge region using a scannable triple Langmuir probe on a shot-by-shot basis. In H-mode, a pressure pedestal that has a hyperbolic tangent shape and a ~ 2 cm ∇p_e scale length is observed, in contrast to a linear shape in L-mode. Autopower spectra of the collected ion saturation current in H-mode discharges show a factor of ~ 3 reduction in fluctuations in the 50–200 kHz band with respect to L-mode. Two Langmuir probes with 8 cm poloidal separation have been installed on Pegasus. The turbulence correlation length in the edge will be measured by radially scanning the probes. Knowledge of the correlation length will be used to inform the design of a future 8-channel radial multiprobe array. This system will simultaneously measure the dynamic $n_e(R,t)$, $T_e(R,t)$, and $\Phi(R,t)$ profiles and fluctuations across the L-H mode transition and be used to investigate nonlinear ELM dynamics.

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