

Abstract Submitted  
for the DPP13 Meeting of  
The American Physical Society

**Access to and Characterization of Ohmic H-mode Plasmas at Near-Unity Aspect Ratio**<sup>1</sup> R.J. FONCK, M.W. BONGARD, K.E. THOME, M.G. BURKE, L.M. PEGUERO, J.M. PERRY, D.J. SCHLOSSBERG, P.C. SHRIWISE, D.S. THOMPSON, University of Wisconsin-Madison — The low H-mode transition power threshold at near-unity aspect ratio allows access to H-mode in the PEGASUS experiment with only Ohmic heating. Ohmic H-mode plasmas are achieved in both a limited and a new separatrix-limited magnetic configuration. H-mode is attained with high-field-side centerstack fueling, with densities from 1 to  $> 3 \times 10^{19} \text{ m}^{-3}$  and Greenwald fractions  $\sim 0.2\text{--}0.7$  for  $I_p \sim 0.13 \text{ MA}$ . Compared to L-mode plasmas, H-modes show: a doubling of the stored energy; reduced D- $\alpha$  emission; edge current pedestal with characteristic width of  $\sim 2 \text{ cm}$ , with 6 cm for L-mode; reversal of the edge toroidal flow from counter-current to co-current; reduced V-sec consumption due to increased temperatures; and ELM excitation. Operation at  $A \sim 1.15$  results in strong particle trapping,  $f_T \sim 0.7 - 0.9$ , and associated neo-classical effects even at modest plasma temperatures so that  $P_{OH} \sim 0.4 \text{ MW}$ , which readily surpasses the estimated threshold power of  $< 0.1 \text{ MW}$ . Low-field-side fueling appears to degrade access to and quality of the H-mode plasma. Characterization of H-mode access in PEGASUS will provide unique data at near-unity A and guide detailed studies of ELM dynamics, as well as provide a critical tool for exploring the extremely high- $\beta_T$  regime at  $A \sim 1$ .

<sup>1</sup>Work supported by US DOE Grant DE-FG02-96ER54375.

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Date submitted: 11 Jul 2013

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