

Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Sorting Category: 5.6.4 (E)

Characterization of edge instabilities in the Pegasus toroidal experiment¹ M.W. BONGARD, D.J. BATTAGLIA, J.A. COLE, C.C. HEGNA, E.T. HINSON, A.J. REDD, A.C. SONTAG, G.R. WINZ, University of Wisconsin - Madison — Field-aligned, rotating edge filamentary structures are observed on a routine basis in Pegasus Ohmic discharges. Imaging studies using a fast-framing camera indicate the filaments are large-scale, short-lived, coherent structures with an average lifetime varying between 10 and $\approx 150 \mu\text{s}$. Measurements using a pair of toroidally separated, radially scannable internal magnetic probes indicate that these structures are electromagnetic in nature. They are clearly distinguished from typical 2/1 tearing activity and appear as low amplitude, broadband ($\leq 150 \text{ kHz}$) magnetic turbulence. These fluctuations are not observed on probes far from the plasma edge, suggesting high poloidal mode number. The high edge current density ($j_a \sim 100 \text{ mA/m}^2$) and low toroidal field ($|B_{\phi,a}| \sim 0.1 \text{ T}$) typical in Pegasus may make the edge unstable to peeling modes. Additional magnetic probe arrays will be implemented, allowing a more accurate determination of n and m , as well as estimates of filament propagation velocity.

¹Supported by US DOE grant DE-FG02-96ER54375.

Prefer Oral Session
 Prefer Poster Session

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Date submitted: 21 Jul 2008

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