Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Study of Impurities in the Pegasus Toroidal Experiment[1]
K.E. THOME, A.S. DOWD, R.J. FONCK, D.J. SCHLOSSBERG, University of Wisconsin-Madison — In the PEGASUS experiment, three distinct operating regimes are currently under study: 1) ohmic heating; 2) helicity injection from local arc guns in the plasma edge; 3) and helicity-driven startup followed by ohmic drive. The levels and roles of impurities are significant for each regime. They are of particular importance in helicity-driven plasmas due to the presence of local plasma gun injectors in the scrape-off region. Plasma impurities are monitored by: a 32 channel AXUV bolometer diode array to determine P_{RAD}; a visible bremsstrahlung spectrometer to determine $\langle Z_{eff} \rangle$; and a SPRED VUV spectrometer to identify the impurity species. Ohmic plasmas show very low radiated power, with VUV spectra dominated by O emission. Helicity driven plasmas show strong N and O emissions, which presumably arise from interaction with the guns' BN shields. Determination of absolute impurity concentration is in progress. Qualitatively, it is noted that plasmas with handoff from helicity to ohmic drive do not show radiative collapse, despite P_{RAD} levels comparable to that of a purely helicity-driven plasma.

[1]Work supported by US DOE Grant DE-FG02-96ER54375.

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Date submitted: 16 Jul 2010 Electronic form version 1.4