

Ion Temperature Measurements in the Pegasus Toroidal Experiment¹ M.G. BURKE, M.W. BONGARD, R.J. FONCK, D.J. SCHLOSSBERG, University of Wisconsin-Madison — Ion temperature measurements are being made on the PEGASUS Toroidal Experiment in OH and helicity-injection driven plasmas using thermal Doppler broadening of emission spectra. The system consists of a 0.75 meter monochromator with UV sensitive optics, an image intensifier, and a high speed imaging system that can achieve a 5 kHz frame rate. Presently the system achieves a spectral resolution of 0.21 Å, and collects light over a single radial chord. Of particular interest is the ion temperature evolution during non-solenoidal startup using point source helicity injection. Turbulent magnetic reconnection during helicity injection is expected to provide strong ion heating, as seen in lab and astrophysical plasmas. Indeed, $\langle T_i \rangle$ is measured to be ~ 0.5 keV while $\langle T_e \rangle$ is estimated to be ≤ 0.1 keV from passive impurity spectroscopy. Presently the system is used to compare the T_i evolution of plasmas produced through helicity injection, OH drive, and hybrid current drive scenarios. Future upgrades will provide plasma rotation measurements using multiple tangential views in PEGASUS.

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- Prefer Oral Session
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