Abstract Submitted
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Electron Cyclotron Heating Plasmas at the Wisconsin Plasma Astrophysics Laboratory[1] JASON MILHONE, MICHAEL CLARK, JOHN WALLACE, DAVID WEISBERG, CARY FOREST, University of Wisconsin-Madison, WIPAL TEAM — A 2.45 GHz CW electron cyclotron heating (ECH) system has been added to the Wisconsin Plasma Astrophysics Laboratory (WiPAL) to increase plasma performance, allowing access to regimes where flow driven plasma instabilities are relevant. Plasma breakdown has been achieved with 10-15 kW of injected RF power at neutral pressures as low as 5×10^{-6} Torr demonstrating good confinement from WiPALs multi-cusp scheme. Fast electrons have been observed visually in magnet rings where nothing has been inserted. Both over- and under-dense plasmas have been observed as the neutral fill pressure is varied. With ECH, the plasma density and cathode stirring are decoupled; This allows for high performance plasmas at lower neutral fill pressures with high ionization fraction, thus reducing the momentum loss to charge-exchange collisions. Initial results from the full suite of WiPAL diagnostics, including langmuir/mach probes, optical emission spectroscopy (OES), and millimeter-wave interferometry, will be shown.

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Jason Milhone
University of Wisconsin-Madison

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