

Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Plasma MRI Experiments at UW-Madison K. FLANAGAN, M. CLARK, University of Wisconsin-Madison, V. DESANGLES, Laboratoire de Physique de l'Ecole Normale Supérieure de Lyon, R. SILLER, J. WALLACE, D. WEISBERG, C.B. FOREST, University of Wisconsin-Madison — Experiments for driving Keplerian-like flow profiles on both the Plasma Couette Experiment Upgrade (PCX-U) and the Wisconsin Plasma Astrophysics Laboratory (WiPAL) user facility are described. Instead of driving flow at the boundaries, as is typical in many liquid metal Couette experiments, a global drive is implemented. A large radial current is drawn across a small axial field generating torque across the whole profile. This global electrically driven flow is capable of producing profiles similar to Keplerian flow. PCX-U has been purposely constructed for MRI experiments, while similar experiments on the WiPAL device show the versatility of the user facility and provide a larger plasma volume. Numerical calculations show the predicted parameter spaces for exciting the MRI in these plasmas and the equilibrium flow profiles expected. In both devices, relevant MRI parameters appear to be within reach of typical operating characteristics.

Ken Flanagan
University of Wisconsin-Madison

Date submitted: 24 Jul 2015

Electronic form version 1.4