Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Initial Results from the Magnetized Dusty Plasma Experiment (MDPX)[1] EDWARD THOMAS, UWE KONOPKA, BRIAN LYNCH, STEPHEN ADAMS, SPENCER LEBLANC, DARRICK ARTIS, Auburn University, AMI DUBOIS, University of Wisconsin, ROBERT MERLINO, The University of Iowa, MARLENE ROSENBERG, University of California - San Diego — The MDPX device is envisioned as a flexible, multi-user, research instrument that can perform a wide range of studies in fundamental and applied plasma physics. The MDPX device consists of two main components. The first is a four-coil, open bore, superconducting magnet system that is designed to produce uniform magnetic fields of up to 4 Tesla and non-uniform magnetic fields with gradients up to up to 2 T/m configurations. Within the warm bore of the magnet is placed an octagonal vacuum chamber that has a 46 cm outer diameter and is 22 cm tall. The primary missions of the MDPX device are to: (1) investigate the structural, thermal, charging, and collective properties of a plasma as the electrons, ions, and finally charged microparticles become magnetized; (2) study the evolution of a dusty plasma containing magnetic particles (paramagnetic, super-paramagnetic, or ferromagnetic particles) in the presence of uniform and non-uniform magnetic fields; and, (3) explore the fundamental properties of strongly magnetized plasmas ("i.e., dust-free" plasmas). This presentation will summarize the initial characterization of the magnetic field structure, initial plasma parameter measurements, and the development of in-situ and optical diagnostics.

[1]This work is supported by funding from the NSF and the DOE

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Date submitted: 11 Jul 2014 Electronic form version 1.4