Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

A table top experiment to study plasma confined by a dipole magnet SUDEEP BHATTACHARJEE, ANUJ RAM BAITHA, Indian Institute of Technology, Kanpur 208016 — There has been a long quest to understand charged particle generation, confinement and underlying complex processes in a plasma confined by a dipole magnet. Our earth's magnetosphere is an example of such a naturally occurring system. A few laboratory experiments have been designed for such investigations, such as the Levitated Dipole Experiment (LDX) at MIT, the Terella experiment at Columbia university, and the Ring Trap-1 (RT-1) experiment at the University of Tokyo. However, these are large scale experiments, where the dipole magnetic field is created with superconducting coils, thereby, necessitating power supplies and stringent cryogenic requirements. We report a table top experiment to investigate important physical processes in a dipole plasma. A strong cylindrical permanent magnet, is employed to create the dipole field inside a vacuum chamber. The magnet is suspended and cooled by circulating chilled water. The plasma is heated by electromagnetic waves of 2.45 GHz and a second frequency in the range 6 – 11 GHz. Some of the initial results of measurements and numerical simulation of magnetic field, visual observations of the first plasma, and spatial measurements of plasma parameters will be presented.

Sudeep Bhattacharjee
Indian Institute of Technology, Kanpur 208016

Date submitted: 20 Jul 2016 Electronic form version 1.4