

Abstract Submitted  
for the GEC17 Meeting of  
The American Physical Society

**Imposed ordered structure in magnetized discharge**<sup>1</sup> PETER HARTMANN, Wigner Research Centre for Physics; CASPER at Baylor University — First experimental findings obtained with the new Magnetized Dusty Plasma Experiment (MDPX at Auburn University) include the formation of ordered structures in high vertical magnetic fields ( $\approx 1$  T) imposed by the wire-grid upper horizontal electrode and visualized by micrometer dust particles levitating on top of the lower flat electrode sheath of a capacitively coupled RF discharge [E. Thomas Jr., *Physics of Plasmas* 23, 055701 (2016)]. Simple arguments based on charged particles being confined to helical trajectories along the magnetic field lines are not sufficient because all relevant collision processes have mean free paths well shorter than the distance between the structured electrode and the lower electrode sheath. We apply our newly implemented 2.5 dimensional GPU accelerated particle in cell (PIC) discharge simulation both for cylindrical geometry to compute global discharge parameters and with cartesian symmetry for the determination of local plasma parameters including the charging and force balance computation of the dust particles with high resolution. The PIC simulations will reveal the microscopic details of how the spatial structure of the upper electrode can migrate through the bulk plasma and influence the structure of the lower sheath region.

<sup>1</sup>Supported by NKFIH Grant K-115805

Peter Hartmann  
Wigner Research Centre for Physics; CASPER at Baylor University

Date submitted: 08 Jun 2017

Electronic form version 1.4