

Abstract Submitted  
for the GEC08 Meeting of  
The American Physical Society

**Self consistent modeling of dusty plasma experiments within a GEC reference cell** VICTOR LAND, ERICA SHEN<sup>1</sup>, LORIN MATTHEWS, TRUPELL HYDE, Center for Astrophysics, Space Physics, and Engineering Research, Baylor University, Waco, TX, USA 76798-7316 — CASPER conducts dusty plasma experiments in two GEC cells. Micrometer sized dust particles are introduced from the top. During their fall toward the lower electrode, they collect ions and electrons from the plasma and charge up. Due to the high electron mobility, this charge is negative and the dust particles are trapped in the electric field above the bottom electrode. There, dust structures form, which might be crystalline. To describe these, knowledge of the local plasma parameters is needed. These could be obtained with probes, but these inevitably perturb the plasma and the dust, and probe contamination makes the collected data unreliable. Since the absorption of plasma on the dust changes the plasma, data obtained with probes in dust free plasma doesn't represent the parameters of dusty plasma. In this paper, the results of a self-consistent model that solves the plasma and the dust parameters simultaneously are presented, which aim to support data obtained from experiments, and to provide a better understanding of the forces acting on the dust, and of the changes in the plasma due to the presence of the dust.

<sup>1</sup>Participant in CASPER's Summer High School Scholars Program

Victor Land  
Center for Astrophysics, Space Physics, and Engineering Research,  
Baylor University, Waco, TX, USA 76798-7316

Date submitted: 05 Jun 2008

Electronic form version 1.4