Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

The Confinement and Sheath Within a Glass Box[1] MUDI CHEN, MICHAEL DROPMANN, JIE KONG, KE QIAO, JORGE CARMONA-REYES, LORIN MATTHEWS, TRUELL HYDE, CASPER - Baylor University — The confinement structure provided by a glass box placed on the lower powered electrode of a GEC rf Reference Cell is proving to be ideal for the formation of vertically aligned structures which are often difficult to obtain under other types of confinement. A glass box also provides a mechanism for controlling the number of dust particles comprising a particular dust structure as well as their size and symmetry. However, given the small volume of the glass box and the fact that each of the glass panes comprising the box develop a new sheath within the plasma environment, the structure of the overall sheath inside is quite different from that produced by the lower electrode alone. Since both the confinement and sheath structure are vital for producing ordered dust particle structures, a better understanding of the underlying physics is sorely needed. In this experiment, the trajectories of dust particles acting as probes while falling through the glass box under various plasma environments are tracked and analyzed. It will be shown that the resulting data provides a map of both the confining force and the structure of the sheath inside the glass box.

[1]Support from the NSF and the DOE (award numbers PHY-1262031 and PHY-1414523) is gratefully acknowledged.

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Date submitted: 21 Jul 2015 Electronic form version 1.4