

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Void Structure in Complex Plasmas TRUELL HYDE, JIE KONG, LORIN MATTHEWS, JERRY REAY, MIKE COOK, JIMMY SCHMOKE, CASPER, Baylor University, PO Box 97310, Waco, TX 76798-7310 — Dust particles imbedded within a plasma will acquire an electric charge from collisions with free electrons in the plasma. If the ratio of the inter-particle potential energy to the average kinetic energy is sufficient, the particles can form either a “liquid” structure with short range ordering or a crystalline structure with longer range ordering. Dust free regions (voids) inside complex plasmas have also been observed to form under microgravity conditions, in sputtering chamber experiments and in a variety of other experimental situations. Experimental observations reveal a stable dust free state often embedded within a dust crystalline structure or liquid state and exhibiting a sharp boundary. A new mechanism for void formation employing an external DC bias on a GEC rf reference cell will be discussed. Experimental results will be shown to be in good agreement with theoretical predictions for this strongly coupled complex plasma system.

Truell Hyde
CASPER, Baylor University, PO Box 97310, Waco, TX 76798-7310

Date submitted: 20 Jul 2005

Electronic form version 1.4