

Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Coulomb fission of a charged dust cloud in an afterglow plasma¹

ROBERT MERLINO, JOHN MEYER, University of Iowa — A dust cloud of 1 micron diameter silica microspheres was confined in a DC glow discharge dusty plasma in argon at a pressure of 100 mTorr (13 Pa). Laser sheet illumination and a fast video camera (2000 frames/s) was used to record the dynamics of this cloud following the switch-off of the plasma and confining forces. Due to the rapid decay of the plasma, and the substantial residual charge on the particles in the plasma afterglow, the cloud evolved under the mutual Coulomb repulsion forces. A variety of dynamic evolutions were observed with different clouds and under different conditions including, Coulomb explosion and expansion. In one case, the cloud underwent a Coulomb fission process, fragmenting into two clouds. Observations and analysis of this Coulomb fission event will be presented.

¹Work supported by DOE

Robert Merlino
University of Iowa

Date submitted: 23 Jul 2015

Electronic form version 1.4