

Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Dust particle circulation and vortices in a dc glow discharge dusty plasma¹ AYDEN KISH, EDWARD THOMAS, Auburn University — Complex, or dusty, plasmas introduce a new charged species - dust grains of up to a few microns in diameter - to the dynamics of a background plasma discharge. While the size of these dust grains allow us to observe many plasma phenomena macroscopically, their presence also results in the generation of other processes that are unique to dusty plasmas. This presentation reports the observations of a recent study of toroidally-shaped dust clouds in a direct-current Argon plasma discharge. These dusty plasma clouds are formed by placing a conducting ring on a lower electrode while generating the plasma using an upper, biased electrode. Dust particles become suspended in the plasma between the two electrodes and, under the correct pressure and discharge conditions, the toroidally-shaped cloud is formed. This work reports on a variety of experimental configurations used to generate the clouds, measurements of particle flow and rotation using particle image velocimetry (PIV), and initial characterization of the plasma conditions that lead to the formation of these structures.

¹Auburn University Undergraduate Research Fellowship and U.S. Department of Energy Grant Number DE - SC0010485

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Date submitted: 15 Jul 2016

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