

Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Filamentation in Capacitively Coupled Magnetized Plasmas.¹

STEPHEN WILLIAMS, Auburn University — Recent experiments at the Magnetized Dusty Plasma Experiment (MDPX) at Auburn University have observed the formation of filamentary structures in capacitively-coupled, rf generated plasmas at high magnetic field ($B \geq 0.5$ T). These plasma filaments, when viewed from the side, appear as bright vertical columns aligned parallel to the magnetic field that can either be stable or mobile structures, depending upon the experimental conditions in the plasma. In this work, the MDPX device is used to study the threshold conditions for filamentation formation under a variety of RF power, pressure, and applied magnetic field conditions. At low pressures ($p < 10$ mTorr), low RF power ($P < 5$ W), and high magnetic field, a regime of individual filaments with rotating spiral arms has been identified. This presentation will focus on how those properties of the filaments (size distribution, number, rotation velocity, intensity/density, etc.) vary with the magnetic field. Ultimately, we seek to understand how the filaments scale with fundamental length scales in the plasmas e.g., ion/electron gyroradii and the collision mean free path.

¹This work is supported with funding from the NSF EPSCoR and the NSF/DOE Partnership in Basic Plasma Science and Engineering programs.

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Date submitted: 08 Jul 2020

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