Abstract Submitted
for the GEC13 Meeting of
The American Physical Society

Self-Organized Patterns of Spots In DC Glow Microdischarges in Krypton[1] WEIDONG ZHU, Department of Applied Science and Technology, Saint Peter's University, 2641 Kennedy Blvd, Jersey City, NJ 07306, USA, PEDRO G.C. ALMEIDA, MIKHAIL S. BENILOV, DIEGO F. SANTOS, Departamento de Física, Universidade da Madeira, Largo do Município, 9000 Funchal, Portugal, PRAJWAL NIRAULA, Department of Applied Science and Technology, Saint Peter's University, 2641 Kennedy Blvd, Jersey City, NJ 07306, USA — Self-organized patterns of cathodic spots have been observed in DC microdischarges in xenon. Modeling of microdischarges in xenon has revealed existence of multiple solutions. Some of the solutions describe normal discharges, others describe 2D patterns of cathodic spots, and others describe 3D patterns similar to those observed in experiments. A very interesting question is why modes with self-organized patterns have been observed in DC microdischarges in xenon but not in other gases. Modeling suggests that self-organized patterns can be observed in gases other than xenon provided that conditions are right. In the present work, self-organized patterns of spots observed in DC microdischarges in krypton are reported. The experiments are guided by modeling and the discharge device employed in the experiments consists of a molybdenum foil as the anode, an aluminum oxide plate as the dielectric spacer and another molybdenum foil as the cathode. Each layer of the device is 0.25 mm thick. Circular openings of 0.75 mm in diameter are prepared on both anode and dielectric spacer and are aligned. The whole device is assembled by Torr Seal epoxy. Research grade krypton is used to fill the chamber to a pressure of 200-1200 Torr.

[1]This work was supported by FCT through the projects PTDC/FIS-PLA/2708/2012 and PEst-OE/MAT/UI0219/2011.

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Date submitted: 14 Jun 2013 Electronic form version 1.4