Abstract Submitted
for the GEC16 Meeting of
The American Physical Society

Parametric investigations of striations in electronegative capacitively coupled radio-frequency plasmas[1] YONG-XIN LIU, School of Physics and Optoelectronic Technology, Dalian University of Technology, China, EDMUND SCHUNGEL, Department of Physics, West Virginia University, Morgantown, USA, IHOR KOROLOV, ZOLTAN DONKO, Institute for Solid State Physics and Optics, Wigner Research Centre for Physics, Hungarian Academy of Sciences, Budapest, Hungary, JULIAN SCHULZE, Department of Physics, West Virginia University, Morgantown, USA and Institute for Electrical Engineering, Ruhr-University Bochum, Germany, YOU-NIAN WANG, School of Physics and Optoelectronic Technology, Dalian University of Technology, China — Striated structures in light emission have been observed by Phase Resolved Optical Emission Spectroscopy (PROES) and analyzed based on particle-based kinetic simulations in capacitively coupled rf CF4 plasmas. On this basis, we conduct a systematic study on the effects of external parameters on the striated structure by PROES and particle-based kinetic simulations. Our results exhibit that at 100 Pa pressure and 300 V voltage amplitude striations generally occur within a certain driving frequency range, i.e., between 2 MHz and 18 MHz, and the distance between the ion density maxima decreases with rising driving frequency. A mode discharge transition from the drift-ambipolar into striation mode could be observed by increasing the pressure or rf voltage. The reasons for these observations are further understood by the analytical solution of a simply model of the ion-ion plasma.

[1]This work has been supported by the National Natural Science Foundation of China (NSFC) (Grant Nos. 11335004 and 11405018).

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Date submitted: 05 Jun 2016 Electronic form version 1.4