Abstract Submitted
for the GEC16 Meeting of
The American Physical Society

PIC/MCC simulation for magnetized capacitively coupled plasmas driven by combined dc/rf sources[1] SHALI YANG, YA ZHANG, WEI JIANG, Huazhong University of Science and Technology, School of Physics, Wuhan, Hubei, CN, HONGYU WANG, Anshan Normal University, School of Physics Science and Technology, Anshan, CN, SHUAI WANG, Northeastern University, School of Physics, Shenyang, Liaoning, CN — Hybrid dc/rf capacitively coupled plasma (CCP) sources have been popular in substrate etching due to their simplicity in the device structure and better plasma property. In this work, the characteristics of magnetized capacitively coupled plasmas driven by combined dc/rf sources are described by a one-dimensional Particle-in-cell/Monte Carlo collision (PIC/MCC) model. The simulation is using a rf source of 13.56MHz in argon and at a low pressure of 50mTorr. The effects of dc voltage and magnetic field on the plasmas are examined for 200–400V and 0–200Gs. It is found that, to some extent, dc voltage will increase the plasma density, but plasma density drops with increasing dc voltage. The magnetic field will enhance the plasma density significantly, due to the magnetic field will increase the electron life time and decrease the loss to the electrodes. In the bulk plasma, electron temperature is increased with the magnetic field but decreased with the dc voltage. The electron temperature in sheath is higher than in bulk plasma, due to stochastic heating in sheath is greater than Ohmic heating in bulk plasma under low gas pressure.

[1]National Natural Science Foundation of China (11405067, 11105057, 11305032, 11275039)

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Date submitted: 04 Jun 2016 Electronic form version 1.4