

Abstract Submitted
for the GEC20 Meeting of
The American Physical Society

Effect of slit electrode structure on electron heating and sheath dynamics in capacitively RF discharges HEESUNG PARK, Department of Electrical Computer Engineering, Pusan National University, GEONWOO PARK, Department of Electrical Engineering, Pusan National University, HAE JUNE LEE¹, Department of Electrical Computer Engineering, Pusan National University — In a capacitively coupled plasma (CCP), hollow structure showerheads are commonly used for the control of uniform gas distribution. In this study, we investigate the effect of a slit electrode structure on electron heating and transport in a CCP using a two-dimensional particle-in-cell simulation. As the streamlines of the electric fields near the slit structure are alternated, not only the sheath size but also the particle transport become asymmetric between the powered and the ground electrode. The conventional discharges with asymmetric electrode sizes show that sheath expansion and a negative DC bias occur in front of a smaller electrode. With the slit structure, however, it is possible to control the sheath size as well as the DC self-bias by varying the number of slits and the configuration. Furthermore, it is also possible to control the radial plasma uniformity.

¹Corresponding author

Heesung Park
Department of Electrical Computer Engineering, Pusan National University, Busan

Date submitted: 12 Jun 2020

Electronic form version 1.4