Abstract Submitted
for the GEC19 Meeting of
The American Physical Society

Multi-physics simulation of a capacitively coupled plasma reactor with a non-flat electrode SEUNG-MIN RYU, DYLAN PEDERSON, YUNHO KIM, The university of texas at austin, KENTA SUZUKI, Esgee Technologies Inc, LAXMINARAYAN RAJA, The university of texas at austin, NAMKI CHO, JINSEOK LEE, CHUNGHO CHO, JIHO UH, SANG-JIN CHOI, Samsung electronics, SAMSUNG ELECTRONICS COLLABORATION, ESGEE TECHNOLOGIES INC COLLABORATION, THE UNIVERSITY OF TEXAS AT AUSTIN COLLABORATION — Plasma uniformity in a capacitively coupled reactor is normally controlled by changing tunable process parameters such as electrode power, gas flow rate, and process pressure etc. In this study, we report on the effects of electrode shape on plasma characteristics in dual frequency capacitive argon discharges using a multi-physics plasma fluid model. The geometry of the 2D axisymmetric model consists of a plasma sub-domain, an upper grounded electrode with gas inlet holes, a lower powered electrode that holds a wafer, and dielectric rings. The computational model is developed including a fluid plasma model, which solves the continuity equations for charged species and the electron energy balance equation, coupled with electromagnetic Maxwell's equations for the self-consistent description of the high frequency induced plasma. The simulation results yield the distribution of plasma characteristics such as the charged species density, electron energy distribution, electron temperature and sheath boundary etc. in the plasma space and are used to improve plasma uniformity on the wafer.

Seung-Min Ryu
The university of texas at austin

Date submitted: 04 Jun 2019 Electronic form version 1.4