Abstract Submitted
for the GEC19 Meeting of
The American Physical Society

Simulation Evolution of Ion Energy Distribution Uniformity in Low Pressure Plasma used in semiconductor processes YUN YANG, SHAWMING MA, Mattson Technology, Inc. — Low pressure Inductively coupled plasmas (ICPs) and Capacitively coupled plasmas (CCP) are widely used in semiconductor. Nowadays, atomic layer etchings (ALEs) and depositions (ALDs) have been studied and developed world wide and paid much more attention by using ICP and CCP tools. Processing uniformity are crucial. The uniformity processing of ALEs and ALDs was directly related to the ion energy distribution functions (IEDF) on the wafer surfaces. One challenge in plasma processing is being able to control the ion energy distributions (IEDs) from the presheath to the surface of the wafer which is necessary for maintaining the critical dimension of features and uniformities. In this study, we use 2D self-consistent fluid model, combined with electromagnetic module, and self-consistent Monte Carlo ion kinetic simulations to investigate the uniformities of the ion energy distribution on wafer surfaces employed with both biases applied to the substrate holding the wafer, and in low pressure Argon discharges. Uniformity of ion energy distribution on wafer surfaces are studied with Monte Carlo ion kinetic methods with different AC or DC biases.

Yun Yang
Mattson Technology, Inc.

Date submitted: 03 Jun 2019 Electronic form version 1.4