

Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Two-dimensional hybrid simulation of capacitively coupled plasmas with two rf sources¹ YUAN-HONG SONG, Dalian University of Technology, XIANG XU, ZHEN-HUA BI, YU-RU ZHANG, YOU-NIAN WANG — From 1990s, to improve the performance of the traditional CCP reactors which are widely applied in microelectronic device fabrications, a dual-frequency (DF) source was introduced for the purpose of controlling the plasma density and ion bombardment energy separately. Moreover, in order to improve the radial uniformity of plasma density, a new technique was put forward in which two VHF voltages are applied to the top and bottom electrodes separately with a controlled phase shift between them. In this work, we employ a two-dimensional (2D) fluid model coupled with Monte-Carlo method to investigate the properties of CCP discharges driven by DF or two VHF sources. The ion energy distribution function (IEDF) and electron energy distribution function (EEDF) are calculated based on the discharge parameters resulting from the fluid model. In virtue of the full set of Maxwell equations, the electromagnetic effect induced by VHF sources has been also discussed.

¹Supported by the National Natural Science Foundation of China (No.10775025 and No.10635010).

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Date submitted: 14 Jun 2010

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