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Striation Characteristics in Radio-Frequency Capacitively Coupled Discharges under Different Conditions KALLOL BERA, SHAHID RAUF, JOHN FORSTER , KEN COLLINS, Applied Materials, Inc. — In radio-frequency (RF) capacitively coupled discharges, striations with spatial periodic structure have been observed. Thermoelectric effect that reduces electron energy diffusion has been proposed[1] as a mechanism generating the periodic structure. The thermoelectric coefficient is calculated using Bolsig+[2], and incorporated in our fluid plasma model. Two- and three-dimensional modeling of RF capacitive discharge is first done without thermoelectric effect. The charged species densities are then randomly perturbed, and the growth or decay of different modes with time is observed. Multiple peaks in electron density are formed in an almost periodic manner. The result shows that N_2 plasma with weaker thermoelectric effect is more stable than Ar plasma. With increase in secondary electron emission from the electrodes, plasma peaks intensify. Magnetic field increases plasma peaks at lower pressure. For a design with multiple steps on the electrode, distance between plasma peaks is modified. In addition, the striation characteristics are modified by pressure, electrode spacing, rf power and rf pulsing. Compared to two-dimensional model, plasma peaks are stronger in three-dimensional model. [1]Mackey et. al, Appl Math Lett, 2005 [2]Hagelaar and Pitchford, Plasma Sources Sci. Technol., 2005

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