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Fluid simulation of the phase-shift effect in hydrogen capacitively coupled plasmas[1] YU-RU ZHANG, XIANG XU, School of Physics and Optoelectronic Technology, Dalian University of Technology, ANNEMIE BOGAERTS, Department of Chemistry, University of Antwerp, YOU-NIAN WANG, School of Physics and Optoelectronic Technology, Dalian University of Technology — A 2D self-consistent fluid model coupled with the full set of Maxwell equations is established to investigate the phase shift effect on the radial uniformity of plasma characteristics in a hydrogen capacitively-coupled plasma. The study was carried out at various frequencies in the range of 13.56-200 MHz. At 13.56 MHz, the plasma density is off-axis peaked at $\varphi = 0$. When the frequency rises to 60 MHz, the profiles shift smoothly from edge-peaked over uniform to center-peaked as the phase difference increases. At 100 MHz, a similar behavior is observed, except that the maximum moves again towards the radial edge at $\varphi = \pi$. When the frequency is 200 MHz, a better uniformity is again obtained at $\varphi = \pi$. Moreover, the phase shift effect on the transient behavior of electrodynamics has also been examined at 13.56 MHz and 100 MHz.

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