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Self-consistent simulation of high-frequency driven plasma sheaths[1] MOHAMMED SHIHAB, Ruhr University Bochum, DENIS EREMIN, THOMAS MUSSENBROCK, RALF PETER BRINKMANN, Ruhr University Bochum — Low pressure capacitively coupled plasmas are widely used in plasma processing and microelectronics industry. Understanding the dynamics of the boundary sheath is a fundamental problem. It controls the energy and angular distribution of ions bombarding the electrode, which in turn affects the surface reaction rate and the profile of microscopic features. In this contribution, we investigate the dynamics of plasma boundary sheaths by means of a kinetic self-consistent model, which is able to resolve the ion dynamics. Asymmetric sheath dynamics is observed for the intermediate RF regime, i.e., in the regime where the ion plasma frequency is equal to the driving frequency. The ion inertia causes an additional phase difference between the expansion and the contraction phase of the plasma sheath and an asymmetry for the ion energy distribution bimodal shape. A comparison with experimental results and particle in cell simulations is performed.

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