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Particle-in-cell simulations of a large capacitively coupled plasma discharge[1] DENIS EREMIN, DANIEL SZEREMLEY, THOMAS MUSSENBROCK, RALF-PETER BRINKMANN, Ruhr-University Bochum — A capacitively coupled low-pressure plasma discharge with large electrode radius (25 cm) and a large grounded side chamber radius (25 cm) is simulated with a particle-in-cell code for different driving frequencies. The simulations reveal the importance of plasma dynamics in the side chamber for the whole plasma discharge. In particular, it is observed that at 60 MHz the plasma density profile in the side chamber features an unexpected hump close to the side chamber entrance. At the same time the self-bias at this frequency virtually vanishes despite large geometrical asymmetry of the reactor, which is also not anticipated in a single-frequency driven discharge. The plasma density profile uniformity exhibits a pronounced frequency dependence as well.

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