Abstract Submitted
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Magnetic Asymmetry Effect in Capacitively Coupled RF Discharges[1] BIRK BERGER, MORITZ OBERBERG, DENNIS ENGEL, CHRISTIAN WOELFEL, DENIS EREMIN, JAN LUNZE, RALF PETER BRINKMANN, PETER AWAKOWICZ, JULIAN SCHULZE, Ruhr University Bochum, RUHR UNIVERSITY BOCHUM TEAM — The Electrical Asymmetry Effect is known to allow control of plasma parameters such as the discharge symmetry, DC self-bias, and energy distribution functions in capacitively coupled plasmas (CCP). It is based on using consecutive harmonics with adjustable phases. Theoretical studies recently predicted a similar effect by applying a magnetic field which decreases from one electrode to the other. This was introduced as Magnetic Asymmetry Effect (MAE) and is based on the presence of different plasma density regions. In this work, we show results of experimental investigations on the MAE in a single frequency CCP at 13.56 MHz and 1 Pa with a magnetron-like magnetic field configuration at the powered electrode. Increasing the radial magnetic flux density allows to control the DC self-bias, the mean ion energies at the electrodes and the symmetry parameter. Additionally, we show measurements of the RF current in the middle of the grounded electrode as a function of the magnetic field. We find that the generation of high frequency oscillations of the discharge current induced by the self-excitation of the Plasma Series Resonance can be controlled magnetically.

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