

Abstract Submitted
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The Electrical Asymmetry Effect in multi-frequency capacitively coupled radio frequency discharges¹ JULIAN SCHULZE, ZOLTAN DONKO, Hungarian Academy of Science, EDMUND SCHUENGEL, UWE CZARNETZKI, Ruhr-University Bochum — In capacitively coupled radio frequency discharges the Electrical Asymmetry Effect (EAE) provides the opportunity to generate a DC self bias η electrically. In dual-frequency (df) discharges operated at two consecutive harmonics with adjustable phase shift θ between the driving voltages η is generated as a function of θ . The ion energy can be controlled separately from the ion flux at the electrodes by tuning θ in df discharges. Here, the EAE in geom. symmetric argon discharges driven at multiple consecutive harmonics is investigated by a PIC simulation: Compared to df discharges a significantly stronger self bias can be generated electrically. The mean ion energy at the electrodes can be controlled separately from the ion flux over a broader range. An analytical model demonstrates that df discharges represent only one particular - with respect to ion energy control less effective - scenario in the frame of a more abstract understanding of the EAE. A recipe how to customize the applied voltage waveform to generate the strongest possible DC self bias and to obtain maximum control of the ion energy will be presented.

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