

Abstract Submitted
for the GEC12 Meeting of
The American Physical Society

Kinetic simulations of magnetized capacitively coupled discharges¹ JAN TRIESCHMANN, MOHAMMED SHIHAB, DENIS EREMIN, RALF PETER BRINKMANN, JULIAN SCHULZE, THOMAS MUSSENBROCK, Ruhr University Bochum — Capacitive high frequency discharges are of crucial importance in the context of plasma etching, deposition and surface modification. As these single or multiple frequency discharges are oftentimes operated at low pressures of less than a few pascal, a high plasma density is commonly achieved with the use of external magnetic fields. In this work kinetic simulations are used to investigate the effect of inhomogeneous external magnetic fields on the discharge dynamics in a strongly nonlocal pressure regime. We found that capacitively coupled discharges can be largely asymmetrized by applying strong magnetic fields in front of a given target electrode. This not only has an effect on the plasma density, but also on the ion energy distribution functions (IEDF) at the electrodes and on the acceleration of fast electrons in the plasma sheath regions. In consequence in the discharge currents a generation of higher harmonics of the driving frequency can be observed. We investigate these scenarios in terms of 1D-3V Particle in Cell simulations.

¹This work is supported by the German Research Foundation in the frame of TRR 87

Jan Trieschmann
Ruhr University Bochum

Date submitted: 16 Jun 2012

Electronic form version 1.4