

GEC08-2008-000015

Abstract for an Invited Paper
for the GEC08 Meeting of
the American Physical Society

Nonlinear Effects on Heating in Capacitive Discharges¹

THOMAS MUSSENBROCK, Ruhr University Bochum

In low-pressure capacitive RF discharges two mechanisms of electron heating are dominant: i) Ohmic heating due to electron-neutral collisions and ii) stochastic heating due to momentum transfer from the oscillating sheath. Numerous models have been proposed in order to study electron heating phenomena. However, these models do not account for non-sinusoidal RF currents due to self-excitation of the plasma series resonance. Recently, analytical and numerical calculations of both enhanced Ohmic electron heating and enhanced stochastic electron heating due to nonlinear series resonance excitation have been described. This paper discusses the phenomenon of resonance excitation induced by nonlinear plasma-sheath interaction in capacitive discharges and its effect on electron heating.

¹The work is funded by the Deutsche Forschungsgemeinschaft DFG.