Modelling and Simulation of multi-frequency capacitive discharges STEFAN BIENHOLZ, PHILIPP MERTMANN, PETER AWAKOWICZ, Ruhr University Bochum, AEPT, THOMAS MUSSENBROCK, RALF PETER BRINKMANN, Ruhr University Bochum, TET — In material processing applications the energy distribution function and the angular distribution function of energetic ions which are accelerated by the electric field in the plasma boundary sheath play a crucial role. The calculation of such distribution functions requires either large computational cost within the frame of numerical simulation of a plasma reactor as a whole or the electric field is assumed to be given by simple expressions. However, an appropriate discharge (or sheath) model is needed. In this contribution we propose a locally one-dimensional model of a capacitive discharge based on a ion fluid description self-consistently coupled to Poisson's equation. The model allows for self-consistent calculation of the electric field for (arbitrary) multi-frequent discharge excitation and thus for calculation of ion distribution functions by means of an efficient Monte-Carlo code.

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