Abstract Submitted
for the GEC19 Meeting of
The American Physical Society

A spectral-kinetic approach for the planar multipole resonance probe[1] MICHAEL FRIEDRICHS, Institute of Product and Process Innovation, Leuphana University of Lneburg, JUNBO GONG, RALF PETER BRINKMANN, Institute of Theoretical Electrical Engineering, Ruhr University Bochum, JENS OBERRATH, Institute of Product and Process Innovation, Leuphana University of Lneburg — The planar multipole resonance probe (pMRP) is a diagnostic-tool based on the concept of active plasma resonance spectroscopy (APRS), which excites the plasma in the GHz range and records the response to detect resonances. Due to its planar design the pMRP is especially suited to monitor plasma processes without perturbing them. To determine plasma parameter from measured resonance, a model for the relation between plasma and resonance parameter is required. By means of the cold plasma model a relation between electron density and the resonance frequency can be derived. Another important plasma parameter is the electron temperature, which has to be determined by a different resonance parameter, namely the half-width of the resonance peak. However, a measured resonance peak in a low pressure plasma is broadened by kinetic effects, which requires a kinetic model to derive a correct relation between the half-width and the electron temperature. In this work a spectral kinetic approach - a particle simulation where the fields are calculated in the Fourier space - for the pMRP will be presented to analyze the influence of kinetic effects on the half-width.

[1]The authors gratefully acknowledge funding by the German Research Foundation (DFG) within the project OB 469/1-1.

Michael Friedrichs
No Company Provided

Date submitted: 31 May 2019 Electronic form version 1.4