Abstract Submitted
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Kinetic Damping in the Spectrum of the Spherical Impedance Probe[1] JENS OBERRATH, Institute of Product and Process Innovation, Leuphana University Lueneburg, Germany, RALF PETER BRINKMANN, Theoretical Electrical Engineering, Ruhr University Bochum, Germany — Active plasma resonance spectroscopy is a widely used diagnostic method and several probes in different designs have been invented. One of them is the Spherical Impedance Probe. Its resonance behavior and the influence of kinetic effects on it can be described by a general kinetic model presented by the authors [1]. It was theoretically shown that kinetic effects are responsible for a broadening of the resonance peak in the spectrum. However, the broadening of the resonance peak in a kinetically determined spectrum in the geometry of an existing probe is not evaluated, yet. We present such a spectrum of the Spherical Impedance Probe. Therefore, the general solution of the model is expanded in an orthonormal system of basis-functions. This expansion is truncated to determine an approximated spectrum. Its resonance peak shows clearly a broadening compared to a peak in a spectrum, which is determined by a fluiddynamical model.

[1] J. Oberrath and R.P. Brinkmann, Plasma Sources Sci. Technol. 23, 045006 (2014)

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Jens Oberrath
Institute of Product and Process Innovation,
Leuphana University Lueneburg, Germany

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