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**Active Plasma Resonance Spectroscopy: A Kinetic Functional Analytic Description**[1] JENS OBERRATH, THOMAS MUSSENBROCK, RALF PETER BRINKMANN, Ruhr University Bochum — The term "active plasma resonance spectroscopy" refers to a plasma diagnostic method which employs the natural ability of plasmas to resonate close to the plasma frequency. Essential for this method is an appropriate model to determine the relation between the resonance frequencies and demanded plasma parameters. Measurements with these probes in plasmas of a few Pa typically show a broadening of the spectrum that cannot be predicted by a fluid model. Thus, a kinetic model is necessary. A general kinetic model of electrostatic resonance probes has been presented by the authors [1]. This model is used to analyze the dynamic behavior of such probes, especially the spherical Impedance Probe and the Multipole Resonance Probe. It is shown, that damped resonances occur even in collisionless plasmas. Such a collisionless damping is caused by kinetic effects and is responsible for the broadening in a measured spectrum. Thus, the solution of the kinetic model can be used to determine the relation between the broadening of the resonance peak and the "equivalent electron temperature."

[1] J. Oberrath, T. Mussenbrock, R.P. Brinkmann, arXiv: 1305.7253 [physics.plasm-ph]

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