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Kinetic Description of the Impedance Probe¹ JENS OBERRATH,
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THOMAS MUSSENBROCK, RALF PETER BRINKMANN — Active plasma resonance spectroscopy is a well known diagnostic method. Many concepts of this method are theoretically investigated and realized as a diagnostic tool, one of which is the impedance probe (IP). The application of such a probe in plasmas with pressures of a few Pa raises the question whether kinetic effects have to be taken into account or not. To address this question a kinetic model is necessary. A general kinetic model for an electrostatic concept of active plasma spectroscopy was presented by R.P. Brinkmann [1] and can be used to describe the multipole resonance probe (MRP) [2]. In principle the IP is interpretable as a special case of the MRP in lower order. Thus, we are able to describe the IP by the kinetic model of the MRP. Based on this model we derive a solution to investigate the influence of kinetic effects to the resonance behavior of the IP.

[1] R.P. Brinkmann, Bulletin of the APS **54** no. 12, BM 4 (2009)

[2] M. Lapke et al., Appl. Phys. Lett. **93**, 051502 (2008)

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