

Abstract Submitted
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The application of the multipole resonance probe to industrially relevant processes MORITZ OBERBERG, MARCEL FIEBRANDT, STEFAN RIES, CHRISTIAN WOELFEL, PETER AWAKOWICZ, Ruhr-University Bochum, INSTITUTE OF ELECTRICAL ENGINEERING AND PLASMA TECHNOLOGY TEAM — The Multipole Resonance Probe (MRP) has recently been introduced as a novel diagnostic for electron density measurements. Based on active plasma resonance spectroscopy (APRS), the probe measures a resonance whose frequency depends mainly on the electron density. Benchmark measurements in different low pressure plasmas are presented.

A lot of academic work such as modeling, simulations, and experiments was done in recent years to develop the MRP. Here, measurements in industrial processes such as sputtering and plasma ion assisted deposition (PIAD) are presented. Due to the ceramic tube surrounding the probe, it is very insensitive against dielectric coatings as long as the coating's thickness is small compared to the thickness of the ceramic tube. Thus, the MRP is a highly functional and fast diagnostic for such deposition processes, where other diagnostics, e. g. Langmuir probes, fail. It can be used for real-time process monitoring and has been tested in control loops to stabilize deposition processes.

Further challenges for both academia and industry are addressed such as the compensation of the rf modulated sheath as well as the search for actuation variables in control loops and the dependence of film properties on the control working point.

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