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Simulations of the real planar multipole resonance probe in electrostatic approximation[1] MICHAEL FRIEDRICHS, Institute of Product and Process Innovation, Leuphana University of Lneburg, DENNIS POHLE, ILONA ROLFES, Institute of Microwave Systems, Ruhr University Bochum, JENS OBERRATH, Institute of Product and Process Innovation, Leuphana University of Lneburg — Active Plasma Resonance Spectroscopy (APRS) is an industry compatible plasma diagnostic method, which takes advantage of the ability of the plasma to resonate in the near of the electron plasma frequency. The planar multipole resonance probe (pMRP) is a specific design of APRS and a promising candidate to monitor plasma processes without perturbing them, due to its planar design, which is mounted inside of the chamber wall. Based on the cold plasma model an analytic solution of the response function for the ideal pMRP could be derived, which allowed to determine the resonance frequency of the probe plasma system. However, the geometry of the real pMRP is more complicated and requires a numerical model for full 3D electromagnetic simulation in CST. The calculated resonance frequencies of both models are qualitatively in excellent agreement, but differ in the exact position. This difference is dominated by the difference in the geometry, which cannot be taken into account in the analytic solution. Thus, a simulation of a more realistic geometry in electrostatic approximation will be presented in Comsol Multiphysics. The results will be compared to the former investigations to fully understand the influence of the geometry.

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