

Abstract Submitted
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Global model for active control of capacitive radio frequency magnetron discharges DENNIS ENGEL, DENNIS KRUEGER, CHRISTIAN WOELFEL, MORITZ OBERBERG, JAN LUNZE, PETER AWAKOWICZ, RALF PETER BRINKMANN, Ruhr University Bochum, Germany — Sputtering technologies have a widespread of applications in modern industries. Up to now, no appropriate model is available for active control of these processes. Controlling inhibits the drift of process parameters and therefore helps to improve the quality of deposited thin films. The aim of this work is to develop a global model for radio frequency capacitively coupled plasma (RF-CCP) magnetron discharges. Several global models for RF-CCPs have been proposed [1], but most of them neglect the existence of a magnetic field inside the plasma. This work builds on existing models but takes into account the underlying magnetic field. Therefore a lumped circuit model with its corresponding system of differential equations is formulated and the influence of the magnetic field is analysed. The proposed model is used to investigate several parameters such as neutral gas pressure, magnetic field strength or applied voltage, to be able to actively control thin film growth.

[1] T. Mussenbrock et al., PSST **16**, 377385 (2007)

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