

Abstract Submitted
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An Effective RF Sheath Model that Includes Thermal and Non-harmonic Modulation Effects LAURA KROLL, SCHABNAM NAGGARY, DENNIS ENGEL, RALF PETER BRINKMANN, Ruhr University Bochum, Bochum, Germany — The emergence of a boundary sheath in front of material surfaces is a universal plasma phenomenon. The characteristics of RF modulated boundary sheaths arise from the nonlinear interaction of the electrons and ions with the electric field. In order to understand the sheath behavior and the transition to the plasma, a mathematical system of equations covering the dynamics of all elements must be solved. Ab initio sheath models are particularly complex and mathematically cumbersome, because they involve coupled integro-differential equations, which can be solved only numerically. Effective models aspire to reduce the complexity of models by simplifying assumptions. Lieberman, for example, utilized the hard step model, which neglects thermal effects to arrive a compact algebraic description of a sinusoidal modulated sheath [1]. This contribution will employ the recently developed smooth step model [2] to establish a sheath model which includes also thermal effects and covers the influence of non-harmonic modulation.

[1] M. A. Lieberman 1989 *IEEE Trans. Plasma Sci* **17** 338

[2] R.P. Brinkmann 2015 *Plasma Sources Sci. Technol.* **24** 064002

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