

## Bachelorarbeit

# Assessing the Role of Metastables in Low-pressure CCP Discharges with help of 1D Hybrid Code

Lehrstuhl für Theoretische Elektrotechnik

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- **Inhalt:** Low-pressure plasmas are very prominent in the plasma processing industry due to their special properties, which make them conducive for plasma etching, thin film deposition, and other industrial applications. In order to better control the processes taking place in plasma reactors and optimize operation of existing reactors or design of new reactors to better reach the application goals, one has to understand physics of such reactors. In the case of low pressure plasma discharges kinetic description is frequently the only alternative for adequate description of such plasmas due to the large mean free path of the electrons, which can be comparable or even larger than characteristic system size. Furthermore, due to complexity of such plasmas analytical models and experimental methods have limited applicability. Under such circumstances numerical modeling offers an indispensable tool for obtaining insights into the physics of low-pressure plasma discharges. In order to adequately simulate electrons in the kinetic framework, while describing the complex chemistry, a 1D hybrid code has been constructed. There is an indication that the metastable atoms and molecules can play an essential role in the low-pressure plasmas.
- **Zielsetzung:**
  - Check if the contribution of metastables is significant at low pressures using the hybrid code for different plasmas
- **Anforderungen:**
  - Basic understanding of low pressure plasma physics
  - Basic knowledge of programming in C