

# P - Modeling and Simulation of Carbon Dioxide Plasma in RF Ion Sources Performance for Ion Beam Applications

Thursday, November 14, 2024 1:00 PM (1h 30m)

RF driven plasma, characterized by its simple structure and high plasma density, is advantageous for various applications such as ion beam implantation and ion mass spectrometry. To support these purposes, modeling different ion beams within the RF ion source is essential for conducting simulation studies and predicting its plasma conditions. This study investigated the characteristics of carbon dioxide plasma produced through inductive coupling. A 2D axisymmetric structure was defined to simulate the production of carbon and oxygen in an RF ion source, using numerical plasma simulation code. The plasma was modeled using the plasma module of COMSOL Multiphysics, integrating diverse reaction data. The simulation was performed using COMSOL code to calculate carbon and oxygen plasma parameters, and the resulting data will be adapted for use in ion beam extraction modeling. This study was involved in deriving the optimal parameters and conditions for plasma discharge phenomenon and ion beam application.

## Paper submission Plan

## Best Presentation

## Contribution track

ICABU WG2. Beam Physics, Diagnostics & Novel Techniques

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