



Contribution ID: 1993 Contribution code: TUPA125

Type: **Poster Presentation**

Plasma simulation and optimization of a hot surface -microwave hybrid ion sources

Tuesday, 9 May 2023 16:30 (2 hours)

To generate high-current B⁺ ion beams for ion implantation, a hybrid ion source that combines electron cyclotron resonance and thermal surface ionization, which is called a high-temperature surface microwave source (HSMS), is under development. A high-temperature hot surface (2000°C) and microwave heating are the essential components of an HSMS to produce high-energy electrons for the B⁺ generation. A helical tungsten filament will be used in the HSMS source to obtain a high temperature and provide an axial configuration with a magnetic field of approximately 875 Gs for the 2.45-GHz electron cyclotron resonance. The mixing ionization of high-temperature surface ionization and ECR ionization is a very complex ionization process. To understand the influence of the two ionization modes on plasma, this paper proposes a plasma model to simulate the mixing processes of the two ionizations. The effects of high-temperature surface ionization and ECR ionization were separately evaluated. The magnetic field configuration, microwave power, and air pressure have been studied through this plasma model.

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary author: ZHANG, Ailin (University of Science and Technology of China)

Co-authors: PENG, ShiXiang (Peking University); MA, Tenghao (Peking University); WU, Wenbin (Peking University)

Presenter: ZHANG, Ailin (University of Science and Technology of China)

Session Classification: Tuesday Poster Session

Track Classification: MC3: Novel Particle Sources and Acceleration Techniques: MC3.T01: Proton and Ion Sources