



Contribution ID: 23

Type: **Poster (by default)**

## 2.45 GHz Surface Wave Plasma Source Development for Plasma Flood Gun

In a modern ion implanter, plasma flood gun (PFG) is used to neutralize wafer charge during doping process, preventing the breakdown of floating wafers caused by the space charge accumulation. Surface wave plasma (SWP) source that has a simple structure and no hot filament requirement, which can avoid metal pollution, is a potential competitive prospect as a PFG for ion implanter. At Peking University (PKU), SWP source research based on 2.45 GHz microwave is launched recently. Our aim is to establish a high intensity plasma with gas pressure in  $10^{-3}$  Pa order that are critical required by ion implanter. To achieve this goal, we established a two-dimensional axisymmetric discharge model to optimize the structural parameters of the SWP source. Counting in various physical parameters in a 2.45GHz SWP source, such as electron temperature, electron density, electric field mode, energy deposition and electron generation rate, a prototype SWP source with RF coupling through a cylindrical dielectric antenna was designed and tested. In subsequent continuous wave (CW) experiments, the extracted electron beam can be more than 90 mA at input RF power of 500 W and argon gas pressure of  $5.5 \times 10^{-3}$  Pa. Detail will be presented in this article.

### Funding Agency

NSFC 11975036

### Email Address

sxpeng@pku.edu.cn

**I have read the Code of Conduct to attend ICIS2023.**

### Presenter if not the submitter of this abstract

Shixiang Peng

**Primary authors:** CUI, Bujian (Peking University); PENG, Shixiang (Peking University); MA, Tenghao (Peking University); Dr WU, Wenbin (Institute of Applied Physics and Computational Mathematics, Beijing 100094, China); JIANG, Yaoxiang (Peking University)

**Presenter:** PENG, Shixiang (Peking University)

**Session Classification:** Tuesday

**Track Classification:** Fundamental Processes in Ion Sources, Plasma