



Contribution ID: 152

Type: **Poster (by default)**

Overcoming Plasma Shifting by Designing a Langmuir Probe for Precise Microwave Plasma Characterization

Microwave plasmas fascinate researchers and scientists, yet it is a challenging field of research. The Central University of Punjab (CUPB) in Bathinda, established a 2450MHZ microwave flash design facility [1,2] to examine the properties of this peculiar kind of plasma. During ignition of the plasma, plasma shifting in the waveguide caused several problems. Even though microwave coupling and cavity design models worked out well, plasma shifting persisted. . By re-examining the design, the problem was identified at the plasma electrode's form. To fix the plasma shifting inside the waveguide, a shifting mechanism was adapted and it opened up new opportunities for microwave plasma research. The experiment used a lab made Langmuir probe using of ceramic pipes of various sizes with tungsten wire as the probe. After the Langmuir probe's structural design and construction was completed, a breadboard electronic circuit was tested and the Langmuir probe could detect the microwave plasma. The Langmuir probe which was used to measure microwave plasma properties is also discussed in detail.

Funding Agency

NA

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Track Classification: Fundamental Processes in Ion Sources, Plasma