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Contribution ID: **4384** Type: **Poster Competition (Graduate Student) / Compétition affiches (Étudiant(e) 2e ou 3e cycle)**

(G*) (POS-16) Laser Induced Fluorescence (LIF) investigations of inductively coupled plasma used for plasma immersion ion implantation (PIII)

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Plasma Immersion Ion Implantation (PIII) allows the modification of the surface properties of materials used for the manufacturing of semiconductor devices.
It is based on a target immersed in plasma on which a series of negative high-voltage pulses (NHVP) is applied in order to accelerate plasma ions into the target surface.
Understanding the evolution of plasma parameters during the implantation process, such as electron and ion temperature, electron density, plasma potential, and ion velocity, is crucial for a good control of PIII.
The objective of this research is to study the sheath evolution during PIII, as it is critical for controlling the implantation dose, the rate of implantation, and the charge accumulation on the surface of the sample.
Experiments are conducted at the USask Plasma Physics Lab using a low-temperature low-pressure Inductively Coupled Plasma (ICP) radio-frequency plasma source. Using Laser-Induced Fluorescence (LIF) diagnostic, time-averaged spatially resolved measurements of the ion velocity distribution function (IVDF) and ion temperature are obtained in the first step. In a second step, time-resolved LIF measurements will be made to obtain the evolution of the IVDF in the sheath region
during the implantation process.

Keyword-1

Laser induced fluorescence

Keyword-2

Sheath

Keyword-3

Plasma

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