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**Experimental Observation of Sheath-presheath Instabilities**

VARA PRASAD KELLA, JOYDEEP GHOSH, DEVENDRA SHARMA, PRABAL K CHATTOPADHYAY, Institute for Plasma Research — Instabilities in the Sheath-presheath regime are most important phenomena that can affect the plasma-wall interaction. These instabilities can modify the particle flow velocities and distribution functions in that regime. In this present work, instabilities exist in the sheath-presheath in a low temperature plasma are observed. Experiments are carried in single ion species argon plasma and multi ion species Ar-He plasma. Experiments are carried in a stainless steel chamber with filament discharge plasma. Sheath is produced around a stainless steel grid at center of the chamber. Fluctuations from the grid and cylindrical Langmuir probe are recorded. Langmuir probe is used to get the floating potential fluctuations from presheath and bulk plasma as well. In single ion species argon plasma, there are two instabilities observed namely ion-ion counter streaming instability through mesh grid and ion acoustic instability respectively arises in the presheath. In case of multi-ion Ar-He plasma, two stream instability also explored. The neutral pressure threshold for the sustain of these instabilities also observed.

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