

# Seminar

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## Institute for Plasma Research

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**Title:** Observation of sub-sonic plasma flow in the Helicon Plasma Experimental device  
**Speaker:** Dr. Mariammal Megalingam  
Institute for Plasma Research, Gandhinagar  
**Date:** 31<sup>st</sup> August 2023 (Thursday)  
**Time:** 03:30 PM  
**Venue:** Online - Join the talk:  
[https://meet.ipr.res.in/join/7512056197?be\\_auth=OTU4Nzc0](https://meet.ipr.res.in/join/7512056197?be_auth=OTU4Nzc0)  
(Conference ID: 7512056197, Password: 958774)

### Abstract

Plasma Flow has been observed in space and ionosphere. Accurate measurement of plasma flow can give a better insight in understanding of many phenomenon e.g., Interaction of satellites moving through stationary space plasmas, magneto-hydro-dynamic phenomena observed in space and fusion plasmas, various wall material studies etc. Institute for Plasma research, Gandhinagar (IPR) has developed a Helicon plasma device and recently set up a Helicon Plasma Thruster (HPT) for studying space related technological applications. Plasma flow velocity plays a vital role in thrust evolution as well as understanding and hence we have initiated development of different types of Mach probe, a proven tool to measure plasma flow velocity in magnetized and unmagnetized plasma. This experiment has been performed in the helicon plasma device which has a special feature of magnetic nozzle whose gradient can be varied to create plasma flow. The axial and radial scanning of plasma has been carried out by different Mach probes for different RF power and magnetic field. Mach numbers and Plasma flow velocity has been measured and it is observed that it lies in sub-sonic plasma flow regime for 400 W RF power and 300 G magnetic field. Other plasma parameters such as plasma density, electron temperature has been measured using dog-leg Langmuir probe. The details of the work done and plan of future work will be discussed.

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