

Seminar

Institute for Plasma Research

Title : Study of plasma instability confined by a versatile multi-pole line cusp magnetic field

Speaker: Dr. Amit Kumar Patel

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Date : 5th February 2020 (Wednesday)

Time : 10:00 AM

Venue : Committee Room 3, (New Building), IPR

Abstract :

The multi-pole cusp magnetic field plasma device has been constructed successfully at the Institute, and hot filament based Argon plasma has been characterized. The Argon plasma thus produced and confined by multi-pole line cusp magnetic field is found to be having different characteristics at different regions. The central high beta plasma volume is found to be quiescent ($\delta n/n < 1\%$) and uniform and also it is found that to be controllable by changing the magnet current. The edge region of plasma device has plasma parameters gradient across the magnetic field and excite the different plasma instability.

This talk presents a study of high frequency instability in the high-plasma beta region (mid region) of an inhomogeneous six pole cusp magnetic field plasma device. It has been observed that the frequency of the instability changes explicitly with the changing pole magnetic field values of magnets. Moreover, the scale lengths of plasma parameters, frequency spectrum, cross-correlation function, and fluctuation level of plasma densities have been measured in order to identify the instability. The cross field drift velocity due to fluctuation in plasma parameters has been measured from the wave number-frequency $S(kz, \omega)$ spectrum.
