

Seminar

Institute for Plasma Research

Title: Study of Intrinsic Toroidal Rotation Measurements with tokamak plasma parameters in ADITYA-U Tokamak

Speaker: Mr. Aman Gauttam
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Date: 07th April 2026 (Tuesday)

Time: 04:00 PM

Venue: Seminar Hall, IPR

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Abstract

Investigating intrinsic toroidal rotation in tokamaks is very much important because it controls plasma stability and improves confinement in future reactors, like ITER, where external momentum input from neutral beams will be minimal. In the ADITYA-U tokamak, the intrinsic toroidal rotation velocity of C^{5+} ions is routinely monitored using Doppler shift spectroscopy. A high resolution multi-track spectrometer with lines of sight spanning from core to the edge region of ADITYA-U tokamak is used measure the radial profile of toriodal ion rotation velocity. As there is no neutral beam in the ADITYA-U tokamak, the 529.05 nm transition of C^{5+} produced via passive charge exchange, is used to study the radial profile of rotation velocity. In this work, the core toroidal rotation velocity has been also investigated with the variation of plasma current and line average electron density. A correlation study between core and edge toroidal rotation velocity has been also carried out to understand how these are related. It has been observed that the core and edge toroidal rotation velocities are in either same or opposite direction depending on the plasma parameters.

[1] Kumar A. et al 2024 Nucl.Fusion 64 086019

[2] Shukla G. et al 2021 Rev. Sci. Instrum. 92 063517

[3] Shukla G. et al 2019 Atoms 7 93
