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Seminar

Institute for Plasma Research

Title : Design, Development and Characterisation of a Passive Active Multijunction RF Launcher Compatible with ADITYA –Upgrade Tokamak

Speaker: Mr. Yogesh M. Jain
Institute for Plasma Research, Gandhinagar

Date : 05th February 2021 (Friday)

Time : 03.30 PM

Venue : Online - Join the talk:

https://meet.ipr.res.in/PhD_defense_talk_Yogesh_Jain_05_02_2021

Abstract :

A Passive Active Multijunction (PAM) launcher compatible with the ADITYA -U tokamak is designed and developed to drive the plasma current non inductively. The launcher is a phased waveguide array structure with an alternate active and passive waveguide arrangement. It provides efficient thermal management, exhibits lower reflection coefficients even at densities close to the cut-off near launcher mouth and can be retracted back to avoid hostile edge plasma conditions.

The launcher was designed to be compatible with the ADITYA -U tokamak and would launch 250 kW of RF power for 1 s at 3.7 GHz. Various port size and plasma considerations were taken into account while designing the launcher. It was evaluated for its RF performance in COMSOL Multiphysics. The thermal and mechanical performance of the launcher in terms of its temperature rise and mechanical stress while launching the RF waves was also evaluated.

The launcher was fabricated and its RF performance in terms of S parameters was measured. Further, a novel technique to evaluate $N||$ profile and power spectrum of the launched RF waves is also proposed. The RF results obtained using this technique and the S-parameter measurements of the fabricated PAM launcher were found to be in good agreement with the simulation results.

This talk would present the design, development and the results obtained via simulations and measurements of the PAM launcher.
