Seminar

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Institute for Plasma Research

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Title: Development of mock-up RF matching network for ICRH system of Tokamak and its optimization with continuously variable load

Speaker: Dr. Abhinav Jain
Tel Aviv University, Israel

Date: 30th November 2022 (Wednesday)

Time: 03:30 PM

Venue: Join the online meeting:

https://meet.ipr.res.in/join/6653994603?be_auth=NDY4NzQy
(Conference ID: 6653994603; Password: 468742)

Abstract

The real ICRH systems of the tokamaks are spatially distributed in very long distances and unreliable for implementation of the research problem. Therefore, we have developed a mock-up of ICRH system at the test bench. To reduce the size of the mock-up and make it accommodate at the test bench, the mock-up is designed for lower power handling capability and scaled at five times the ICRH frequency. Now, the mock-up can be a useful set-up on a single test bench where research problems related to the ICRH system of Tokamak can be tested before final implementation.

Talk will cover the development of various components of the mock-up ICRH system such as 3dB hybrid coupler, directional couplers, rigid coaxial tapped transmission line, coaxial stub tuners, line stretcher, RF antenna, variable water load etc. Since these component designs are novel in many respects and the mock-up have been integrated as in the similar layout of the ICRH system and tested using VNA for the desired performance. A computational program has been developed with a defined control sequence to control the detectors and matching components. The developed system has been optimized for the best possible speed using the developed program. The developed system is capable of automatically match any arbitrary load and tested for load resilient behavior.

The talk will also cover some of my work from my postdoctoral experience.