

Seminar

Institute for Plasma Research

Title : Design and Calibration of FMCW Reflectometer for Plasma Diagnostics

Speaker: Dr. Rohit Mathur

Institute for Plasma Research, Gandhinagar

Date : 22nd June 2022 (Wednesday)

Time : 03.00 PM

Venue : Committee Room 2, IPR

Online - Join the talk:

<https://lobby.ipr.res.in/DesignandCalibrationofFMCWReflectometerforPlasmaDiagnostics>

Abstract :

Reflectometry is an established diagnostic to measure the density profile for tokamak plasmas. Function of this diagnostic has not been limited to measuring the density profiles, it has been deployed to measure electron fluctuations, measurement of local electric field, rotation velocity and will also be employed to obtain the location of the plasma in the upcoming ITER project.

Reflectometry is a variation of the FMCW RADAR principle which works on the coherent phase measurement principle. Broadband swept frequency Reflectometry is a well established diagnostic to measure the electron density profile [$n_e(r)$]; here r is the radial position of tokamak plasmas and has been used to measure electron density profiles for tokamaks.

In this talk Design detail of 4-8 GHz homodyne FMCW reflectometer, Characterization of single stage superheterodyne circuit and simulation study of Luneburg lens on k-band horn antenna will be discussed.
