

Characterization of Microwave Components in the Millimeter Wave Spectrum Using Microwave Instrumentation

Abstract

The project proposal aims to thoroughly characterize microwave components within the millimetre wave spectrum using advanced microwave instrumentation such as spectrum analyser, signal generator, and Vector Network Analyser (VNA). The work will focus on analysing key components including antennas, filters, amplifiers, and waveguides across various frequency bands, such as E-band (60-90 GHz) and W-band (75-110 GHz).

Utilizing spectrum analysers, the frequency response and spectral characteristics of components will be examined. Signal generators will enable precise control and generation of millimetre wave signals for testing. VNAs will allow for the measurement of complex scattering parameters, impedance, and phase information.

Through systematic experimentation and analysis, we seek to understand the behaviour and performance of these components in different frequency bands. This project will facilitate the design and optimization of high-frequency systems for applications in plasma diagnostics, telecommunications, radar, and beyond.

Academic Project Requirements:

1) Required No. of student(s) for academic project: 2

2) Name of course with branch/discipline: B.E./B.Tech. Electronics and Instrumentation Engineering

3) Academic Project duration:

(a) Total academic project duration: 8 Weeks

(b) Student's presence at IPR for academic project work: 5 Full working Days per week

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