DESIGN AND ANALYSIS OF MICROSTRIP PATCH ARRAY ANTENNA FOR SPACE APPLICATIONS

A project report submitted in partial fulfillment of the requirements for the award of degree of

BACHELOR OF TECHNOLOGY

IN

"ELECTRONICS & COMMUNICATION ENGINEERING"

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CERTIFICATE

This is to certify that the project work entitled **"DESIGN AND ANALYSIS OF MICROSTRIP PATCH ARRAY ANTENNA FOR SPACE APPLICATIONS "** is being submitted for the partial fulfillment of requirements for the award of Bachelor of Technology in Electronics & Communication Engineering is a bonafied work done by **P. PREMANJALI (20811A0453), L.K.N.G. MALLIKA (21815A0403), S. RAMA DINESH (20811A0467), B. YESWANTH (21815A0418), P. JAGADEESH (21815A0406)** under guidance during year 2023-2024 and it has been found suitable for acceptance according to the requirements of the University.

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ABSTRACT

Microstrip patch antenna arrays play important role in aircraft, spacecraft and missile applications because of their lighter weight, low volume, low cost, low profile, smaller in dimensions besides easy installation and aerodynamic profile are constrains. This project presents a single and 2×2 array antenna of rectangular topology is designed to operate at S Band. The operating frequency of array is from 2 to 4 GHz. The antenna array has been designed and simulated using HFSS. The array antenna design at operating frequency 2.4GHz, FR4 Substrate with dielectric constant of 4.4 and thickness of substrate 1.6mm. The antenna performance using normal patch and with slits on patch are also compared in terms of Bandwidth and Directivity are measured to finalize the antenna design.

The resonant frequency is chosen at 2.4GHz which is suitable for Space Applications. HFSS is used to the software environment to design and compare the performance of the antenna. Based on the result analysis, it is noted that holes on rectangular microstrip patch array antenna offers higher bandwidth, higher radiation efficiency and directivity as compared with the rectangular Microstrip patch array antenna and also noted that holes on single patch antenna offers higher bandwidth, higher radiation efficiency and directivity as compared with the single patch antenna.