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Rectangular Patch Antenna with Truncated Cuts and Slot for Satellite Communication Applications

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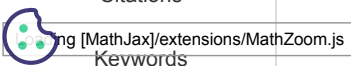
Abstract:

A rectangular patch antenna with truncated cuts and a slot in the center of the rectangular patch suitable for satellite communication applications is proposed in this paper. The dimensions of the proposed antenna is $18.5 \times 21.8 \times 1.6 \text{ mm}^3$ and the dimensions of the patch is $8.9 \times 12.2 \text{ mm}^2$. The proposed antenna is a triple band antenna, resonating at 3.6GHz, 6.7GHz, and 14.1GHz with a bandwidth of 530MHz (3.42GHz to 3.95GHz), 990MHz (6.50GHz to 7.49GHz) and 3.67GHz (13.05GHz to 16.72GHz) with a gain of 1.67 dBi, 5.91 dBi, and 5.30 dBi respectively. By incorporating an L-Shaped DGS offers a circular polarization band of 260MHz (16.21GHz to 16.47GHz) is obtained. The proposed antenna operates in S, C and Ku bands useful for satellite communication applications. Simulations are carried out using Ansys HFSS software.

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I. INTRODUCTION

Due to the advantages like high data rates and large channel capacity the usage of wireless communication is increasing day by day. Advanced Antenna Systems (AAS) is now a practical alternative for extended deployments in current 4G and upcoming 5G mobile networks because of recent technological advancements. As a result, AAS greatly improves both uplink and downlink network performance. Understanding the traits of both AAS and multi-antenna features is necessary to identify the best AAS variants for a given network deployment to achieve performance benefits and cost-effectiveness. Circularly Polarised Microstrip Antennas (CPMA) are preferred in satellite and mobile communication systems, RADAR tracking, GPS, and WLAN systems.

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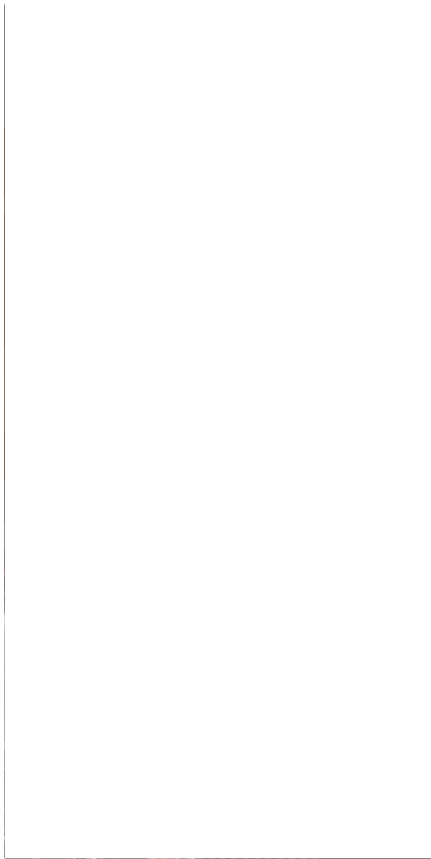
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