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Compact Multiband Microstrip Fractal Antenna Design for Wireless Applications – An Overview

Publisher: IEEE

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Abstract:
Rapid development in telecommunication technology innovation over the ongoing recent past years, there is an expanding interest for the smaller dimension, multiband frequency of operation and low priced microstrip antennas. The fractal patch can be utilized in meeting the necessities of the Multi-band, low profile, and compact antenna structures. Different procedures and calculations have been presented for size decrease and multi-band activity of microstrip fractal antennas. The purpose behind the popularity of fractal antenna use is their electrically weighty structure which alters proficiently into the reduced size and operates at many resonant frequencies. The latest advancements in the design and notion of fractal antenna elements, in addition to fractal antenna geometries used to design a microstrip antenna for size reduction. The multi-band operation are utilized in wireless communication such as medical imaging, Radar communication, and military communication.

Published in: 2020 4th International Conference on Electronics, Communication and Aerospace Technology (ICECA)

Date of Conference: 05-07 November 2020

DOI: 10.1109/ICECA49313.2020.9297629

Date Added to IEEE Xplore: 28 December 2020

Publisher: IEEE

► ISBN Information:

Conference Location: Coimbatore, India

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I. Introduction

There has been a gigantic ever-developing demand, in both military and buyer worldwide markets, for microstrip antenna structures and fabrications that have been accompanying exceptionally attractive characteristics viz. compact size, thin and conformal and working with multiband [1]. Various methodologies developed in the recent past years, which can be utilized to accomplish one or more of these design goals. Recently, the possible way to build models of microstrip patch antennas that use some of the fractal geometry attributes to attain the above features. Since ordinary microstrip antenna comprises a conducting patch radiator mounted on a grounded dielectric and function at resonant cavity elements, therefore its operation leads intrinsically to narrow impedance bandwidth which is a hindrance for microstrip antennas uses in wireless communications further customarily each patch antenna functions at a single frequency band, where a separate antenna is needed for diverse application. This leads to the requirement of a large space for antennas for different communications. In order to mitigate this difficulty, multi-band antennas can be designed and only one antenna can be made to work at several frequency bands as indicated in figure 1 [2]. The multi-band behavior design of the antenna can be achieved by incorporating fractal structures in microstrip antennas. Fractal notions have been progressively more applied for the design and fabrication of a variety of patch antennas in recent years because of their recursive, self-comparable trait and space-filling ability. Figure 1.

(a) 4 antennas with four different frequency bands (b) Single antenna planned be used as a 4 band fractal antenna.

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