

Modeling and Simulation of a Micro-Strip Patch Antenna in Pentagonal Fractal Geometry

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Abstract – The antenna is an important element in the field of communication for transmitting and receiving information in the form of electromagnetic waves, it is also used in several fields such as detection systems, satellites and surveillance aircraft, communications networks and GPS automobiles and satellite communications through the system. The design of the antennas using the A-HFSS software "Ansoft- High Frequency Structure Simulator" is essentially based on the variation of the shape of the antenna and its conductive material, the nature and the thickness of the substrate in order to have a structure that resonates in the desired frequencies for applications precise.

The goal of this work is to study and design a micro strip patch antenna in fractal geometry, regarding the characteristics such as the reflection coefficients, the gain and the radiation implemented in the environment HFSS software. The patch antenna is characterized by its small size, low cost, easy manufacturing and network connectivity. Despite its space-saving appearance, it retains the electromagnetic properties that ensure the device connectivity. We have compared the patch antenna in pentagonal and fractal pentagonal geometry in 1D to 3D pentagonal antenna array on the resonance frequency fed by a micro-strip line in order to have the best characteristics of these antennas; the bandwidth and the directivity of this antenna, using the electromagnetic simulation tool in the frequency domain CST MICROWAVE STUDIO.

The information's will reach: -The resonance frequency is higher for a normal patch antenna compared to that of a fractal patch antenna.

- There is a presence of interferences due to the correctly destination.
- The gain radiation pattern is a dipole (isotropic antenna) in the fractal antenna.
- The bandwidth is wider for a fractal patch antenna compared to that of a normal patch antenna.

Keywords – Micro Strip Patch Antenna; CST MICROWAVE STUDIO; Pentagonal Geometry; Gain radiation.
