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# A Dual Band Star-Shaped Fractal Slot Antenna: Design and Measurement

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## Abstract

In this study a new structure of a star-shaped fractal antenna was designed, simulated and fabricated, to operating at dual band applications. The geometrical of this antenna begins from two conducting squares shape to create an eight-shaped star. Added to that, the fractal geometry slot has been designed using four squares rotating in four angles to forming sixteen triangular slots. Whereas semi-circle slot shaped has

been loaded in the center of the proposed antenna. The suggested antenna was designed and simulated using an Ansoft High Frequency Structure Simulator (HFSS). A few parameters such as return loss, input impedance, and radiation patterns were studying. It is found that the fabricated antenna has a dual band at two resonance frequencies 1.3308 GHz and 2.6992 GHz. The first band is used in the aviation service. While, the second band is used in the space research services, radio astronomy, and earth exploration-satellite. These dual band meets the applications in L- and S-band respectively. The simulated and measured results for return loss of the designed antenna are in a good agreement. Also, the measured and simulated values of the impedance bandwidth of the proposed antenna are (2.31% and 3.62%) and (2.57% and 3.32%), respectively. Interestingly, the semi-circle slot dimensions have significant effect on the simulation results of return loss and antenna efficiency.

## Keywords

Fractal antenna; microstrip antenna; multiband; dual band