M. S. THESIS DEFENSE

INVESTIGATIONS ON THE SIERPINSKI FRACTAL MICROSTRIP ANTENNA FOR WIDEBAND RADIATION PERFORMANCE BY EMPLOYING NOVEL FEED MECHANISMS

By:

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Abstract:

The demand for high speed wireless communications has led to increasing performance requirements for current microstrip patch antenna designs. This has led to numerous design techniques for the enhancement in the bandwidth performance in these antenna types. Due to the proximity of the radiating element to a conducting ground plane, these antennas types have inherently high Q values and thus limited bandwidth performance in their impedance characteristics. To overcome this limitation, much of the focus in these bandwidth enhancement techniques has been in the minimization of any reflections between the excitation source and the antenna. While these techniques have without a doubt have led to high performing, wide bandwidth antenna designs, the radiation performance characteristics are not addressed by many of these techniques. The unique electromagnetic characteristics of fractal geometries on the other hand, offer an interesting alternative to these enhancement techniques. While the incorporation of fractal shapes for microstrip antenna geometries is nothing new, to this point much of the prior works have yielded designs which are to be considered as "multi-band" in their radiation performance. A novel feed technique is proposed in this thesis for exciting the Sierpinski fractal microstrip antenna for the enhancement of the radiation performance over the frequency band from 8GHz to 18GHz. It will be shown through both computer simulation and measurement, that the introduction of such a feed mechanism leads to more uniformly directive, wideband radiation patterns throughout its active frequency band.

------All are welcome----