CHAPTER: 7

HIDDEN WORK ON METAMATERIAL

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FUTURE WORK WITH METAMATERIAL

Advantages

1. Lightweight and low volume
2. Low-profile
3. Low fabrication cost
4. Planar configuration hence can be made conformal to host surface.
5. Support both linear and circular polarization
6. Able to radiate dual and triple frequency
7. Mechanically very robust.

The performance of the metamaterial based antenna is studied with the assistance of simulations and measurements. Parametric analysis shows variations within the optimized dimensions in MTM that affect the operational function of antenna.

In future, metamaterial is an interest for the entire respective field relatively.

- The research in MTMs is versatile and involves many subjects such as material science, physics, chemistry, electromagnetics, etc. Here, we work on significantly in the antenna design field.
- Development of novel antenna for next-generation wireless communication systems which involves new frequency band and wide spectrum such as millimetre- wave communication antenna needs to operate at ultra-wide frequency.
- Enhancement in mutual coupling, to improve diversity parameter and overall MTM performance.
- The main challenge in miniaturized patch antenna design with the low thickness of the substrate and it confines bandwidth and efficiency of the antenna.
- The gain and bandwidth of a antenna depend on the size of overall antenna. This relationship strictly limits the reduction of the physical size of the antenna at higher frequency while concurrently increase bandwidth and radiation efficiency at high frequency. Therefore there is a considerable challenge in reducing the physical size of the antenna at the same time increasing its bandwidth.

- Training, etc. In the wireless body area network critical component is a wearable antenna for wireless communication.
- Development of reconfigurable antenna using different techniques for structured MTMs.
- Implanted antenna design for numerous medical applications. Utilization of MTM properties for developing miniaturized and acceptable radiation level implanted antennas.

HIDDEN WORK IN METAMATERIAL

- Absorber
- Metamaterial based on different material such as graphene
- Enhance of co & cross polarization in antenna with metamaterial
- Work on multi-band and wide band frequency, ultra-wide band frequency with variation in design
- Develop suitable antennas with metamaterial for many bio medical applications.

CONCLUSION

Now days, various feeding techniques used for wide band width, to radiate on ultra-high frequency. Antenna's promising features like compact size, easy design, acceptable gain and stable radiation characteristics make design suitable for WLAN, WiMAX and X-band applications space-craft .Microstrip antenna fabricate in various shapes to form more efficient in power loss. Reflection loss calculation for metal with different concentration of functionalizing element 5-50hz, concentration increases, this shifted to a lower band. In future, advancement done on metamaterial based antenna application for communication, microwave technology.

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