CIRCULAR MICROSTRIP ANTENNA: PERFORMANCE COMPARISON TEST

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ABSTRACT

This project presents the performance valuation of two type of antennas; circular patch on conventional ground plane and metamaterial approach. Both antennas operate at a same frequency of 2.45GHz. The scope of valuations is including the signal strength and data rate and duration to transfer a heavy file. The testing was done using two laptops connected to two transceivers, Bullet M2 Hp that embedded together with an AirOS firmware as the test bed. The antennas were attached to the transceiver in line of sight in order to obtain the optimum signal strength. The scope of project includes recording duration to transfer small-size of video (16.6Mb) and medium-sized movie (369Mb) files from a local to remote host by varying output power of the transceiver, distance and type of antennas at both transmitting and receiving ends. The metamaterial antenna shows a good strength of signal -80dBm with data rate of 1.19Mbps (16.6Mb file) and 2.26Mbps (369Mb file) for a distance of 15 meters, while the conventional antenna only -83dBm with data rate of 1.19Mbps (16.6Mb file) and 1.27Mbps (369Mb file) for maximum 20dBm transceiver output power. The duration of data transfer through metamaterial antenna was 9.12 seconds (16.6Mb) and 163 seconds (369Mb) compared to conventional antenna 13.91 seconds (16.6Mb) and 290 seconds (369Mb), respectively. The project shows that metamaterial offered a better performance compared to the conventional antenna in term of signal strength, data rate and duration taken to transfer a same file.

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