Thesis Title	Gain Enhancement Approach of the Rectangular Microstrip Antenna with a Coaxial Line Feed
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Abstract

Gain enhancement approach of the rectangular microstrip antenna with a coaxial line feed is proposed in this thesis. In the research, the study and experiment are used to determine the antenna effective quantities, such as the effective length and effective permittivity. Because the physical length is changed to the effective length (electrical length) due to the fringing field between microstrip patch and ground plane. The relative permittivity is changed to the dynamic permittivity due to the operating frequency and the microstrip antenna structure. The new forms of the effective length and dynamic permittivity equations are obtained from these research results when the antenna is in the TM_{010} mode. These effective quantities are applied to calculate the antenna characteristics, which are obtained the accurate results. These effective quantities are also used to design and define the accurate antenna parameters, which is obtained the gain enhancement. Transmission line and cavity models are used to determine the input impedance of the antenna. Matching impedance by adjust the feed point along the length of the microstrip patch is considered to enhance gain in another way. The calculated gain results of these microstrip antennas are compared with the experimental results and the previous

calculated results, which are shown that this calculation is accurate and also enhance the gain of this rectangular microstrip antenna.

Keywords : Microstrip Antenna / Gain / Impedance Matching / Microstrip Antenna Design