

ABSTRACT

Motivation in the implementation of pattern reconfigurable antenna is to get a single antenna that has the ability to modify the radiation pattern characteristics as needed, so it will reduce space requirement and also in line with the current trend of telecommunication devices which is more compact.

This thesis has been carried out optimization of single-layer circular patch antenna based coaxial probe feeding and modifications by integrating shorting pins on the side of the patch to get the pattern reconfigurability using genetic algorithms. The main work in this thesis is to optimize the radiation pattern characteristics while maintaining the resonant frequency characteristics of the antenna.

Optimization, simulation, and fabrication was performed at 4 design of single-layer circular patch antenna : *Circular Patch NonCentered-Fed Antenna*, *Circular Patch Centered-Fed with Slit Ring Antenna*, *Circular Patch Centered-Fed with Symmetrical Control Pins Antenna*, and *Circular Patch Centered-Fed with Slot & Pin Antenna*, work at a frequency of 2.4 GHz with Return Loss ≤ -10 dB. The first, second, and last antennas designed to produce 24 possible directions of azimuth radiation whereas the third antenna produces 8 possible with elevation radiation angle of 45° for all antennas.

Keywords: Circular Patch Antennas, Reconfigurable Pattern, Genetic Algorithm.