ABSTRACT

Anechoic chamber is the space used for measurement, especially for microwave antennas. With the anechoic chamber, antenna measurement will become more accurate because there is no electromagnetic waves are reflected. Anechoic chamber provides the measurement accuracy and a controlled electromagnetic environment, and prevent electromagnetic interference from inside and outside the room. Electromagnetic waves emitted by the antenna will be absorbed and dissipated by the absorbent material that is on every wall of anechoic chamber.

The Purposes of this thesis are determine the right material with considering material weight and availability of such materials for use as absorber material, optimizing the angle of the pyramid using genetic algorithm.

By using a combination of genetic algorithm parameters such as: binary chromosome representation, population size 100, crossover probability 0.9, mutation probability 0.125, and the number of generation 200, obtained the following results: for teflon material, which has a value of relative permittivity = 2.1, relative permeability = 1.58, and conductivity = 0, obtained the best fitness value is 4.1441, the angle of the pyramid of 111.094^{o} for the frequency 2000 MHz - 11,000 MHz, TE polarization reflection coefficient = 0.141254 and TM polarization reflection coefficient = 0.00005178. For polyethylen material, which has a value of relative permittivity = 2.25, relative permeability = 1.7, and conductivity = 0, obtained the best fitness value is 4.1796, the angle of the pyramid of 113.438^{o} for the frequency 2000 MHz - 11,000 MHz, TE polarization reflection coefficient = 0.138256 and TM polarization reflection coefficient = 0.00100374. For styrofoam material, which has a value of relative permittivity = 1.5, relative permeability = 1.1, and conductivity = 0, obtained the best fitness value is 3.9394, the angle of the pyramid of 92.343^{o} for the frequency 2000 MHz - 11,000 MHz, TE polarization reflection coefficient = 0.15373 and TM polarization reflection coefficient = 0.000119417.

Keywords: Anechoic Chamber, Genetic Algorithm, Angle of Pyramid