

ABSTRACT

Wall Penetrating Radar (WPR) requires good and sensitive accuracy in order to obtain an image of an object. To achieve this, the emitted bandwidth must be wide. Whereas the desired radiation pattern or transmit pattern is unidirectional, which is in accordance with the concept and function of a wall penetrating radar that is to detect objects that are behind a wall. So, this research is designing microstrip antennas that have been miniaturized by using the fractal koch method with Ultra Wide-Band (UWB) frequency. In this research, a microstrip antenna is designed with a working frequency of 6.85 GHz and unidirectional radiation pattern. The supply technique used is proximity coupled, a technique to produce a wide bandwidth using the Deflected Ground Structure (DGS) method.

In the comparison simulation of the number of iterations, using Rogers Duroid RT5880 material produces antenna dimensions greater than using FR-4 Epoxy material. The resulting bandwidth in the addition of antenna iterations with Duroid material shows the highest bandwidth found in the 2nd iteration and the highest gain in the 1st iteration while for the FR-4 material the highest bandwidth and gain is in the 1st iteration. Then in the second iteration the antenna with Duroid material will be added to the slot and DGS methods were added to widen the bandwidth and reduce the dimensions of the antenna. Then at the last stage the antenna will be added to the reflector to improve the radiation pattern resulting from the use of DGS and to increase the gain of the antenna. The slot antenna using the DGS method and the addition of reflectors produces a gain of 6.825 dBi, VSWR 1.69, return loss of -13.73 dB, unidirectional radiation pattern and 7.5 GHz bandwidth.

Keyword : Wall Penetrating Radar (WPR), Fractal Koch Slot Antenna, Proximity Coupled, Defected Ground Structure (DGS).