ABSTRACT

Cancer is one of the most serious diseases and difficult to detect early. Cancer annually kills around 10 million people. One of them is brain cancer which still haunts the world of health, causing the level of disability and death to affect humans and has a high recurrence rate. In the medical world, brain cancer can be detected in various ways to determine the position of the tumor according to its stage. The tools currently used to detect brain cancer are *x-ray mammography, ultrasound, computed tomography (*CT*) scans, magnetic resonance imaging (*MRI*) scans* and biopsies. However, this method has several limitations in diagnosing cancer cells correctly and is relatively expensive

To overcome the above limitations, this final project research designed and realized a planar ultra wideband (UWB) antenna in the form of a triangular patch with a frequency of 4-6 GHz which is used for early detection of brain cancer. Microstrip antennas can be used in the early detection of brain cancer. They have the characteristics of producing an electromagnetic field at a frequency that can penetrate human tissue, including human head tissue. By using UWB technology, the cost is relatively cheap and the diagnosis is easier. The use of this microstrip antenna has a narrow bandwidth, therefore the Defected Ground Structure (DGS) method is added to widen the bandwidth.

The results of the design and realization of a triangular planar patch antenna with a frequency that works on this antenna is 5 GHz. Simulation of human head tissue phantoms without cancer and with cancer can be detected by the changes in the value of the electric field and the value of Return Loss. Return loss in tissue without cancer is higher with a return loss value of -23.16 dB compared to cancerous head tissue with a size of 20 mm detected with a return loss value of -27.88 dB, a size of 30 mm returns loss value of -26.47 dB, and a size of 50 mm return loss value -29.91 dB.

Keywords: UWB, Planar antennas, *cancer, parameter.*