

## ABSTRACT

Cancer is a condition in which the growth of malignant tumors tend to grow faster and spread to other parts of the body. Methods used to detect cancer are available today, such as X-rays, mammography, MRI techniques and ultrasounds. However, this method requires quite expensive costs. Planar antenna can be an attractive and promising choice because it has many advantages such as lower cost and safer. The Federal Communications Commission (FCC) sets the frequency for the benefit of the medical imaging system, namely Ultra Wideband (UWB) in the range of 3.1 to 10.6 GHz. Therefore, an antenna is needed that can support the UWB system in medical imaging applications.

This Final Project designs and realizes the UWB planar antennas with Defected Ground Structure (DGS) to detect brain cancer. The antenna works in the frequency range of 3.1-10.6 GHz.

This Final Project produces bandwidth of 7.5 GHz, unidirectional radiation pattern, return loss -24.41 dB, and VSWR 1.12 based on simulation result, while the measurement result produce a bandwidth 6.15 GHz, unidirectional radiation pattern, return loss -23.87 dB, and VSWR 1.13. The results of antenna simulation designed can be detect the presence of cancer that is marked by changes in the value of electric fields and the value of return loss in modeling head tissue with cancer and without cancer.

**Keywords:** ultra wideband, planar antenna, brain cancer detection.