

ABSTRACT

Ground Penetrating Radar (GPR) is a radar system that has non-destructive techniques for sensing objects inside the ground such as detection of underground cable damage and observing for an object in the ground without having to dig. To maintain the beam pattern, we need an ultra-wideband (UWB) antenna where the fractional bandwidth is greater than 20% and the ringing level less than -40 dB. Dipole antenna with resistive load is very potential to be applied in GPR because it has UWB characteristics, but it has a double beam which affects the accuracy of the measurement. Previous studies have examined the modification of the dipole antenna to be U-shaped to overcome multiple beams. However, an offset occurs in the footprint because the dipole antenna has the characteristics of a beverage antenna. Offset will result in decreased accuracy of object detection.

In this Final Project discusses modification of U-shaped dipole antenna to V-Shaped to overcome offset in the footprint. The V-Shaped will manipulate the beam direction to be linear. Resistive load in this Final Project research was conducted to increase the bandwidth value and match the impedance between the feed point and the antenna's arm so that the detection quality is better and the UWB characteristics could be achieved.

This Final Project used software for design and simulate the antenna, and realization of V-shaped antenna using FR-4 Epoxy substrate with dielectric constant 4.3 with thickness 1.6 mm. Antennas are designed in the frequency range of 0.1 - 1 GHz and to overcome offset footprint. The results obtained in this Final Project research are the fulfillment of UWB characteristic parameters and topped off offset footprint.

Keyword : footprint, offset, V-shaped Antenna, GPR, Ultrawide-band.