

## ABSTRACT

The Ground Penetrating Radar (GPR) has a capability of detecting buried objects by transmitting electromagnetic signals to ground. The scattered signals reflected by target, known as echo, then received by GPR to be analysed. The buried object can not directly identified when the echo is received, but it need further signal processing. That's why a good signal is needed to produce the proper signal processing.

The raw data were obtained using a Vector Network Analyzer (VNA) with a frequency range between 0.3 - 8000 MHz where it is connected by two antennas to detect buried objects in heterogeneous soil with a depth of 3 cm from the surface. VNA results are processed using software to generate A-scan data. Fast Fourier Transform (FFT) received signals from VNA then multiplied by FFT Monocycle, Gaussian, or Ricker wavelet pulses, to know the best obtained hyperbolic signal. After all A-scans data is processed, B-scan data will be generated to display the hyperbolic signal from the target.

The results obtained after all process are done, the Ricker wavelet method generate the best hyperbolic signal at 3 cm depth. Furthermore, the width of the pulse has an effect to the hyperbolic signal target on the B-scan, if the pulse width has small size, the clutter is slight different with the larger pulse width that generate clutter thicker.

*Keywords:* GPR, VNA, Pulse Shaping, Detection Improvement