

ABSTRACT

Ground Penetrating Radar (GPR) is one of the application development of radar. Like other common radar system, Antenna is one of the important part in GPR. The writer simulates antenna which can be used for transmitting 1.6 ns pulse in this Final Project. The duration of this pulse is in a middle range frequency that can be used for underground wire and mine.

GPR antenna's parameter must *ultrawideband (UWB)* and have ringing level less than 10% for middle resolution. The proposed antenna is wire bowtie antenna with 140° flare angle. Wire bowtie antenna is chosen because of this nature is easy to realize and have enough wide bandwidth. This wire antenna have 30 arms and equipped with 15 resistive loading in each arms. Resistif loading is used to minimize ringing and to make bandwidth wider although will reduce the efficiency of pulse's amplitude . Resistive loads are based on Wu-King profile. Parameter which be analyzed in this Final Project are main pulse and ringing peak to peak amplitude.

For electromagnetic analysis in time domain we use FDTD (finite-difference time-domain) method with FDTD3D software to measure transmitted waveform in time domain. Then realization and measurement of this antenna. In simulation level ringing less than 10%. In measurement fractional bandwidth is 119%, return loss -19.484 dB, VSWR 1.239 in frequensi 600 MHz, reflected coefficient 0.126.

Keyword : GPR, wire bowtie antenna, ultrawideband, ringing, resistif loading, FDTD