

ABSTRACT

In most of Ground Penetrating Radar (GPR) system, antenna play important rule. One of them is GPR for measuring the level of ground dielectric (conductivity and permittivity). Commonly, for solving that problem we use different antenna for different ground type. That adaptation approach can be done by arranging antenna length.

In that consideration, in this research we try to develop a ground dielectric measurer of GPR antenna with optimum antenna length and the ground., so can be found the optimum resolution and penetration according to expected result. Then, hoped the difference length of antenna configuration, conducive for adaptation footprint antenna.

The proposed GPR antenna are wire dipole antenna with 15 cm length, 30 cm length and 60 cm length, where, each antenna optimized each other according to different type of ground dielectric. So there is a relation between length antenna with the level of ground dielectric. For electromagnetic analysis in time domain we use FDTD method with FDTD 3D software for perceiving input impedance of antenna. Then, we measured S21 coefficient to observe transmit waveform and S11 coefficient to measure input impedance at the same observation point using network analyzer. This measurement result, after postprocessing, was compared with FDTD3D simulation result. The simulation result showed that GPR antenna can be optimized according to footprint by altering the length of antenna.

Keyword : GPR antenna, wire dipole antenna, pulse duration, footprint, FDTD.