

Road pavement density measurements using ground penetrating radar (GPR): simulation analysis

ABSTRACT

This paper describes a simulation of Ground Penetrating Radar (GPR) nondestructive method at frequency range of 1.7-2.6 GHz to predict density for various road pavement samples. The method used is very simple, fast, contactless and accurate way to determine the density of road pavement. In this work we used frequency range between 1.7-2.6 GHz due to the high penetration in road pavement. The MATLAB software is used to analyze the simulation data and also for the graphs comparisons. An instantaneous method for measuring the density of road pavement was developed by using microwave transmission/reflection technique and free space method at the chosen frequency. The GPR Mixture Model was used to predict the correlation between the attenuation to the parameters related such as effective permittivity, density and thickness.

Keyword: GPR mixture model; Ground penetrating radar; Road pavement density