Optimization of ground penetrating radar (GPR) mixture model in road pavement density data analysis

ABSTRACT

This paper presents an optimization of GPR mixture model based on the measurements and simulation results at frequency range of 1.7-2.6 GHz. The purpose is to get a most accurate relationship between attenuation and density for various road pavements densities. The proposed method is simple, fast, nondestructive and accurate way to determine the density of road pavement. Density is a one of the important parameter in order to determine the compressive strength of road pavement. In laboratory, a few of received signal strength and measured attenuation for nine road pavement slab samples were taken at four different frequencies. The GPR mixture model has been used to produce the predicted attenuation due to the pavement density. The calculation and selection of mixture model has been discussed thoroughly and only the best performance of GPR mixture model was selected for optimization.

Keyword: Attenuation; Density; Electromagnetic; Ground penetrating radar; Road pavement