

Field test validation of optimized ground penetrating radar (GPR) mixture model at frequency range 1.7 GHz to 2.6 GHz

ABSTRACT

This paper presents the validation of optimized GPR mixture model based on the microwave nondestructive free space method in order to determine the density of road pavement. Density is an important parameter to determine the compressive strength of road pavement for road user safety. The attenuation is a major factor for gathering the density of road pavement predictly. A few of measured attenuation were taken at nine road pavement slab samples in laboratory. The GPR mixture model has been used to produce the simulation data to predict the attenuation. The comparison results between measurement and simulation were investigated. The best performance of GPR mixture model was selected in the optimization technique due to the smallest mean error. An improved attenuation formula or optimized GPR model was obtained from the optimization technique. The validation at field test had been conducted in order to see the performance of optimized GPR model.

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