

Pulse Reflection Response for Dispersive Medium with Lossless Dielectric Layer and Perfectly Conducting Strips

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The ground penetrating radar (GPR) is a useful tool for landmine detection, underground cavity investigation, and locating buried artificial objects [1]. In underground structures, there are various metallic scatterer, for example water pipes, power and communication cables, buried in a complex manner. These metal materials can be corroded over time because of being buried in the underground. Therefore, it is necessary to perform nondestructive inspections of metallic or dielectric materials.

In previous papers [2-5], we have analyzed the pulse reflection response for the dispersion medium with a periodic array of two perfectly conducting strips by using the combination of the fast inversion of Laplace transform (FILT) method [6] and the point matching method (PMM), and investigated the effects of conducting width, observation points, and convergence test for truncation mode number of the electromagnetic field, and so on.

In this paper, we analyze the pulse reflection response for dispersion medium including lossless dielectric layer with conducting strips array as shown in Fig. 1. Numerical results are given by changing the dielectric constant of the lossless dielectric layer.

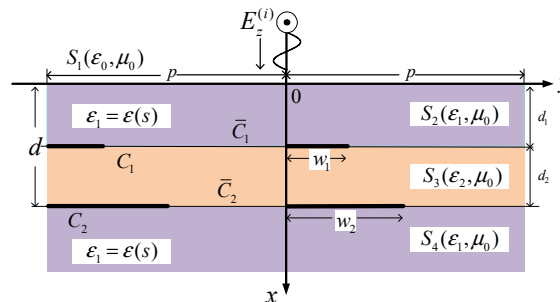


Fig. 1. Structure and coordinate system

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