

Guided Wave Propagation In Single And Double Layer Hollow

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Previous investigations of ultrasonic guided wave propagation in an elastic hollow cylinder and in an elastic hollow cylinder coated with a viscoelastic material have led to the development of inspection techniques for bare and coated pipes.

Guided wave propagation in single and double layer hollow ...

Guided wave propagation in single and double layer hollow cylinders embedded in infinite media The Journal of the Acoustical Society of America 129, 691 (2011 ... Most of the pipes are buried in soil, leading to the significance of the study on the subject of guided wave propagation in pipes with soil influence.

Guided wave propagation in single and double layer hollow ...

Guided wave propagation in single and double layer hollow cylinders embedded in infinite media. Jia H(1), Jing M, Joseph LR. Author information: (1)Department of Engineering Science and Mechanics, The Pennsylvania State University, University Park, Pennsylvania 16802, USA.

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Guided Wave Propagation In Single And Double Layer Hollow

The rail is a highly directional structure and is extremely suitable for guided wave inspection. The guided wave-based method believes that rail damage can induce changes in propagation characteristics of the guided wave (reflected wave, transmitted wave, energy, etc.) [5–7]. The excitation sensors are arranged on one side of the rail with the receiving sensors on the same side or the other side.

Guided Wave Propagation for Monitoring the Rail Base

A very promising non-destructive approach is the guided wave propagation method. Long-range diagnostic capability of elastic waves makes them one of the most attractive tools for non-destructive evaluation (NDE) and structural health monitoring (SHM) systems.

Guided Wave Propagation in Detection of Partial ...

Guided wave propagation in metallic and resin plates loaded with water on single surface . By Takahiro Hayashi and Daisuke Inoue. Cite . BibTex; Full citation; Publisher: AIP Publishing LLC. Year: 2016. DOI identifier: 10.1063/1.4940475. OAI identifier: Provided by: MUCC (Crossref) ...

Guided wave propagation in metallic and resin plates ...

Guided wave-based structural health monitoring (SHM) has been well studied in plate-like structures due to the ability of guided waves to propagate long distances with less energy loss and sensitivity to small defects in the structure. With guided wave SHM most of the methods used in conventional ultrasonics nondestructive evaluation including phased arrays can be implemented.

Guided Wave - an overview | ScienceDirect Topics

As the guided waves propagate through a heterogeneous zone the modal coefficients needed to describe the wavetrain vary with position, leading to interconversions between modes and reflection into backward travelling modes.

Guided wave propagation in laterally varying media - I ...

Guided wave testing is a non-destructive evaluation method. The method employs acoustic waves that propagate along an elongated structure while guided by its boundaries. This allows the waves to travel a long distance with little loss in energy. Nowadays, GWT is widely used to inspect and screen many engineering structures, particularly for the inspection of metallic pipelines around the world. In some cases, hundreds of meters can be inspected from a single location. There are also some applica

Guided wave testing - Wikipedia

The most common UT inspection techniques involve the use of bulk waves in which the boundaries of the structure are just reflectors that do not fundamentally change the mode of propagation. Bulk waves only have two modes; longitudinal and shear, and are typically used to inspect areas near the transducer. Guided Wave (GW) testing on the other hand is a technique in which the ultrasonic waves propagate through the boundaries of a structure, and these boundaries actively affect the mode of ...

Guided Waves: Innerspec's UT Inspection Techniques

Characteristics of the guided wave propagation in the train axle are systematically investigated in this study, so as to explore guided wave-based structural health monitoring (SHM) method for this kind of structure. Piezoelectric patches are used as actuator to excite waves in the axle.

Guided wave propagation in high-speed train axle and ...

Meantime p, q are depending on refractive index and free-space wave number $p^2 = n^2 k_0^2 - \beta^2$, $q^2 = \beta^2 - n^2 k_0^2$, β is a propagation constant. For certain values of parameters k_0, a, n we can find propagation constant β_{nm} for a given n and m . Every β_{nm} corresponds to one possible propagation mode.

What is mode propagation in optical fiber?

Abstract Guided stress waves are considered one of the most efficient and reliable techniques that provide sufficient quantitative and qualitative assessment. In this study, we focused on scrutinizing the propagation behavior of guided waves in western white pine timber poles, experimentally, and numerically using COMSOL Multiphysics.

Understanding the guided waves propagation behavior in ...

Our previous papers reported dispersion curves for leaky Lamb waves in a water-loaded plate and wave structures for several typical modes including quasi-Scholte waves [1,2]. The calculations were carried out with a semi-analytical finite element (SAFE) method developed for leaky Lamb waves. This study presents SAFE calculations for transient guided waves including time-domain waveforms and ...

Guided wave propagation in metallic and resin plates ...

The previous equations provide a general formalism for studying wave propagation in optical fibers. In practice, it is convenient to use a single field variable E . By taking the curl of the first equation and using the others, we obtain. where the velocity of light c is defined as $c = (\epsilon_0 \mu_0)^{-1/2}$.

Wave Propagation in Step-Index Fibers – Fosco Connect

Guided wave propagation in buried pipe is quite challenging since the soil layer is basically a semi-infinite space compared with a pipe wall. A hybrid Semi-Analytical Finite Element method is applied to the buried pipe in this study.

The Pennsylvania State University GUIDED WAVE PROPAGATION ...

A waveguide is a structure that guides waves, such as electromagnetic waves or sound, with minimal loss of energy by restricting the transmission of energy to one direction. Without the physical constraint of a waveguide, wave amplitudes decrease according to the inverse square law as they expand into three dimensional space. There are different types of waveguides for different types of waves. The original and most common meaning is a hollow conductive metal pipe used to carry high frequency ra

Waveguide - Wikipedia

To ensure that the wave propagation can be simulated by the finite element method correctly, the mesh number within a wavelength is typically set to 20, i.e., $L_{max} = \lambda_{min} / 20$, where L_{max} is the maximum element length, and λ_{min} is the shortest wavelength.

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