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Advances in Structural Mechanics and Applications

Proceedings of ASMA-2021 (Volume 2)

Editors: José António Fonseca de Oliveira Correia, Satyabrata Choudhury, Subhrajit Dutta

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About this book

The proceedings of the conference is going to benefit the researchers, academicians, students and professionals in getting enlightened on latest technologies on structural mechanics, structure and infrastructure engineering. Further, work on practical applications of developed scientific methodologies to civil structural engineering will make the proceedings more interesting and useful to practicing engineers and structural designers.

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Keywords

Structural Mechanics

Sustainable and Resilient Structures

Smart Structures

Fluid-Structure Interaction

Vibration and Control

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Topics

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ASMA 2021: **Advances in Structural Mechanics and Applications** pp 226–237

On the Applicability of Wavelet Transform in Localising Defect in a Small Plate Using AE Technique: An Experimental Study

Parikshit Roy, Sanjay Sengupta, Pijush Topdar & Aloke Kumar Datta

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Abstract

Wavelet transform (WT) is one of the popular methods for signal processing in various fields of engineering. In the field of structural engineering, defects like generation and growth of cracks, yielding, failure of bonds, fibre failure etc. is a major cause of concern from the view point of serviceability and economy. Such defects emit transient elastic stress waves in solids. These waves are known as Acoustic Emission (AE) waves and the defects may be called as AE source. Analysis of the

AE waves, which are recorded by AE sensors, are often done for localisation of AE source with the help of WT. Authors previously established a method to localise the damage in plates using WT. However, the localisation process is very useful for large plates. In the present study, the established method is checked for effectiveness of localising defect/AE source in small plates. Experimental tests are conducted using small rectangular plates to localise simulated AE source using WT, Lamb modes and dispersion relation of plates. The result shows, due to edge reflection of AE waves, localisation in small plates is more complex than that in large plates and more study is needed to enhance the effectiveness of the method for small plates.

Keywords

Structural health monitoring

Acoustic emission technique

Source localisation **Wavelet transform**

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