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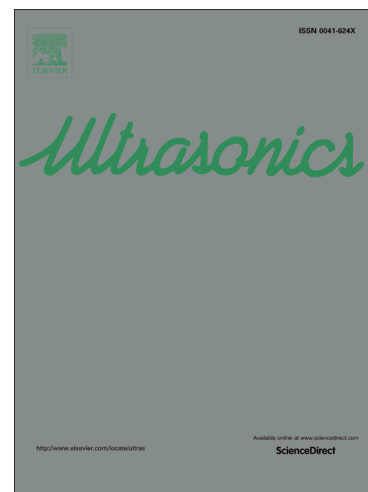
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FREQUENCY SELECTION FOR CODA WAVE INTERFEROMETRY IN CONCRETE STRUCTURES

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Abstract

This study contributes to the establishment of frequency recommendations for use in coda wave interferometry structural health monitoring (SHM) systems for concrete structures. To this end, codas with widely different central frequencies were used to detect boreholes with different diameters in a large concrete floor slab, and to track increasing damage in a small concrete beam subjected to bending loads. SHM results were obtained for damage that can be simulated by drilled holes on the scale of a few mm or microcracks due to bending. These results suggest that signals in the range of 50-150 kHz are suitable in large concrete structures where it is necessary to account for the high attenuation of high-frequency signals.

Key words: Coda wave, CWI, structural health monitoring, ultrasound, diffuse field

1 INTRODUCTION

Nondestructive testing (NDT) or structural health monitoring (SHM) methods based on ultrasonic measurements can be problematic in concrete due to the severe scattering of the waves

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