

## Damage detection in beams using an additional roving mass based on the natural frequency shifting

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*Abstract:* Damage detection plays an exceptional role in the safe maintenance of structures. Techniques which require just the response of the damaged structure are more relevant once in most of the time the intact structure analysis is impracticable. Thus, our purpose is to present a technique that consists in the application of an additional mobile mass along the length of free-free and simply supported beams and the investigation of the variation of the natural frequencies. Next, the Discrete Wavelet Transform (DWT) is applied in the simple and robust signal where the wavelet coefficients amplitude increase allowing the localization of the damage. The obtained results in this paper were satisfactory, this is, the spatial evolution of the natural frequencies of the damaged beam caused a significative change in the damaged region. Finally, the DWT magnified the discontinuities effects becoming a great tool in damage detection studies.

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