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Piezodiagnostics a New SHM Method and its Potential Engineering Applications

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This paper presents a novel approach to damage identification based on the phenomenon of elastic waves propagation. The theoretical background is the dynamic Virtual Distortion Method, which is capable of modelling both a reference excitation signal propagated in the intact structure over a time domain and a perturbed signal due to some damage in the structure. The damage is modelled as stiffness loss. A dynamic inverse analysis is carried out in the time domain in order to identify multi-damage cases in terms of their locations and intensities. The main focus is taken on addressing numerical aspects of the presented approach as well as its potential engineering applications. The related methodology is presented including a brief description of experimental verification. Numerical example with successful identification is demonstrated. Advantages of the approach as well as its challenging points are discussed.

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