عنوان مقاله:
Detection of delamination in cross-ply composite laminated beams utilizing irregularity of mode shapes

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خلاصه مقاله:
In this study, irregularities of the mode shapes are utilized to determine the delamination situation in a composite laminated beam. Modal analysis is used to obtain the mode shapes of the beam; afterwards, the mode shapes are filtered to extract their irregularities. Presence of any delamination and its situation (number, size and location along the length and thickness of the beam) affects the extracted irregularities. Here, detection of delamination is based on these irregularities of the mode shapes. One of the most important advantages of this method is that unlike many other similar methods, in many cases, the mode shapes of damaged structure are sufficient and the mode shapes of the intact structure are not required. The method is validated utilizing the analytical and numerical data for a delaminated beam model. As it will be illustrated, the method can be applied to obtain a very reasonable approximation on the presence of delamination, its size, its location along the length, and number of delaminations for various boundary conditions. In addition, the results show that at least about 10 points of data measurement are required along the length of the beam and the interval of the points should not exceed 1.5 times of the delamination size to be detected.

کلمات کلیدی:
laminated beam; delamination detection; modal analysis; irregularity

لینک نتایج مقاله در سپیلیکا:
https://www.civilica.com/Paper-COMPOSIT02-COMPOSIT02_112.html