

Accepted Manuscript

Detection and characterization of delaminations in composite plates via air-coupled probes and warped-domain filtering

N. Testoni, L. De Marchi, A. Marzani

PII: S0263-8223(16)30707-3

DOI: <http://dx.doi.org/10.1016/j.compstruct.2016.07.005>

Reference: COST 7605

To appear in: *Composite Structures*

Received Date: 24 May 2016

Revised Date: 28 June 2016

Accepted Date: 2 July 2016



Please cite this article as: Testoni, N., De Marchi, L., Marzani, A., Detection and characterization of delaminations in composite plates via air-coupled probes and warped-domain filtering, *Composite Structures* (2016), doi: <http://dx.doi.org/10.1016/j.compstruct.2016.07.005>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Detection and characterization of delaminations in composite plates via air-coupled probes and warped-domain filtering

N. Testoni^a, L. De Marchi^a, A. Marzani^{*,b}

^a*Department of Electrical, Electronic and Information Engineering - DEI, University of Bologna, Viale del Risorgimento 2, 40136, Bologna, Italy*

^b*Department of Civil, Chemical, Environmental and Materials Engineering - DICAM, University of Bologna, Viale Risorgimento 2, 40136, Bologna, Italy*

Abstract

In this work, a novel baseline-free procedure aimed at detecting and sizing delaminations in composite plates is proposed. To such a purpose an air-coupled probe is used to measure the sound pressure in air that is generated by leaky guided waves traveling along the plate and scattered by defects. In particular, by scanning the plate surface with a proper probe tilt angle and lift-off, wavefields dominated by a single guided mode can be obtained. Then, a processing procedure based on warped time-frequency operators is used to filter out the main wavefield generated by the acoustic source in order to enhance the one scattered by defects. Such operators are designed basing on the dispersion curves of the dominant guided mode considered. Finally, it is shown how the scattered wavefield can be further processed to infer the defect position and size by means of the Circular Hough Transform.

*corresponding author, tel: +39 0512093506 - fax: +39 0512093495

Email address: alessandro.marzani@unibo.it (A. Marzani)

URL: <http://alessandromarzani.people.eng.unibo.it> (A. Marzani)

Download English Version:

<https://daneshyari.com/en/article/6705552>

Download Persian Version:

<https://daneshyari.com/article/6705552>

[Daneshyari.com](https://daneshyari.com)