

Web of Science



Search Search Results

Tools Searches and alerts Search History Marked List

Free Full Text from Publisher

Look Up Full Text

Full Text from Publisher

Find PDF

A Export...

Add to Marked List

◀ 1 of 1 ▶

Image-Based Feature Extraction Technique for Inclined Crack Quantification Using Pulsed Eddy Current

By: Nafiah, F (Nafiah, Faris)^[1]; Sophian, A (Sophian, Ali)^[1]; Khan, MR (Khan, Md Raisuddin)^[1]; Hamid, SBA (Hamid, Syamsul Bahrin Abdul)^[1]; Abidin, IMZ (Abidin, Ilham Mukriz Zainal)^[2]

[View Web of Science ResearcherID and ORCID](#)

CHINESE JOURNAL OF MECHANICAL ENGINEERING

Volume: 32 Issue: 1

Article Number: 26

DOI: 10.1186/s10033-019-0341-y

Published: MAR 25 2019

Document Type: Article

[View Journal Impact](#)

Abstract

Existing eddy current non-destructive testing (NDT) techniques generally do not consider the inclination angle of inclined cracks, which potentially harms a larger region of a tested structure. This work proposes the use of 2D scan images generated by using pulsed eddy current (PEC) non-destructive testing (NDT) technique in the quantification of the inclination and depth of inclined cracks. The image-based feature extraction technique effectively identifies the crack axis, which consequently enables extraction of features from the extracted linear scans. The technique extracts linear scans from the images to allow the extraction of three novel image-based features, namely the length of extracted linear scans (LLS), the linear scan skewness (LSS), and the highest value on linear scan (LSmax). The correlation of the three features to surface crack inclination angles and depths were analysed and found to be highly dependent on the crack depths, while only LLS and LSS are correlated to the crack inclination angles.

Keywords

Author Keywords: Pulsed eddy current; 2D scan imaging; Feature extraction; Image processing; Inclined cracks

Author Information

Reprint Address: Sophian, A (reprint author)

+ Int Islamic Univ Malaysia, Dept Mechatron Engr, Fac Engr, Kuala Lumpur 53100, Malaysia.

Addresses:

+ [1] Int Islamic Univ Malaysia, Dept Mechatron Engr, Fac Engr, Kuala Lumpur 53100, Malaysia

+ [2] Agensi Nuklear Malaysia, Leading Edge NDT Grp, Bangi 43000, Selangor, Malaysia

E-mail Addresses: ali_sophian@iium.edu.my

Funding

Funding Agency	Grant Number
Malaysia's Ministry of Higher Education	FRGS16-059-0558

[View funding text](#)

Publisher

SPRINGEROPEN, CAMPUS, 4 CRINAN ST, LONDON, N1 9XW, ENGLAND

Journal Information

Impact Factor: [Journal Citation Reports](#)

Categories / Classification

Research Areas: Engineering

Web of Science Categories: Engineering, Mechanical

Citation Network

In Web of Science Core Collection

0

Times Cited

[Create Citation Alert](#)

19

Cited References

[View Related Records](#)

Use in Web of Science

Web of Science Usage Count

3

Last 180 Days

4

Since 2013

[Learn more](#)

This record is from:

Web of Science Core Collection
- Science Citation Index Expanded

Suggest a correction

If you would like to improve the quality of the data in this record, please [suggest a correction](#).

Document Information

Language: English

Accession Number: WOS:000462256500002

ISSN: 1000-9345

eISSN: 2192-8258

Other Information

IDS Number: HQ2UF

Cited References in Web of Science Core Collection: 19

Times Cited in Web of Science Core Collection: 0

[See fewer data fields](#)

◀ 1 of 1 ▶

Cited References: 19Showing 19 of 19 [View All in Cited References page](#)*(from Web of Science Core Collection)*

1. [Pulsed eddy currents testing using a planar matrix probe](#) Times Cited: 8
 By: Abrantes, Ruben F.; Rosado, Luis S.; Piedade, Moises; et al.
 MEASUREMENT Volume: 77 Pages: 351-361 Published: JAN 2016
2. [Optimisation of pulsed eddy current probe for detection of sub-surface defects in stainless steel plates](#) Times Cited: 23
 By: Arjun, V.; Sasi, B.; Rao, B. Puma Chandra; et al.
 SENSORS AND ACTUATORS A-PHYSICAL Volume: 226 Pages: 69-75 Published: MAY 1 2015
3. [Fast crack profile reconstruction using pulsed eddy current signals](#) Times Cited: 20
 By: Bai, Libing; Tian, Gui Yun; Simm, Anthony; et al.
 NDT & E INTERNATIONAL Volume: 54 Pages: 37-44 Published: MAR 2013
4. [Study on defect classification in multi-layer structures based on Fisher linear discriminate analysis by using pulsed eddy current technique](#) Times Cited: 17
 By: Chen, Xiao; Hou, Dibo; Zhao, Ling; et al.
 NDT & E INTERNATIONAL Volume: 67 Pages: 46-54 Published: OCT 2014
5. [Non-contact ultrasonic detection of angled surface defects](#) Times Cited: 32
 By: Dutton, B.; Clough, A. R.; Rosli, M. H.; et al.
 NDT & E INTERNATIONAL Volume: 44 Issue: 4 Pages: 353-360 Published: JUL 2011
6. [Non-destructive testing of low-energy impact in CFRP laminates and interior defects in honeycomb sandwich using scanning pulsed eddy current](#) Times Cited: 65
 By: He, Yunze; Tian, GuiYun; Pan, Mengchun; et al.
 COMPOSITES PART B-ENGINEERING Volume: 59 Pages: 196-203 Published: MAR 2014
7. [Pulsed eddy current imaging and frequency spectrum analysis for hidden defect nondestructive testing and evaluation](#) Times Cited: 79
 By: He, Yunze; Pan, Mengchun; Luo, Feilu; et al.
 NDT & E INTERNATIONAL Volume: 44 Issue: 4 Pages: 344-352 Published: JUL 2011
8. [Defect characterisation based on pulsed eddy current imaging technique](#) Times Cited: 41
 By: He, Yunze; Luo, Feilu; Pan, Mengchun
 SENSORS AND ACTUATORS A-PHYSICAL Volume: 164 Issue: 1-2 Pages: 1-7 Published: NOV-DEC 2010
9. Title: [not available] Times Cited: 84
 By: Horowitz, P.; Hill, W.
 The Art of Electronics Published: 2015
 Publisher: Cambridge University Press
10. [Classification of pulsed eddy current GMR data on aircraft structures](#) Times Cited: 58