Document details

International Journal of Recent Technology and Engineering
Volume 7, Issue 6, March 2019, Pages 241-245

Determination of stress intensity factor of actuated cracked aluminum plate using strain gages (Article)

Bin Awang Bujang, A.H.I., Hrairi, M., Bin Shaik Dawood, M.S.I.

Department of Mechanical Engineering, International Islamic University Malaysia, PO Box 10, Kuala Lumpur, 50728, Malaysia

Abstract

View references (16)

The rapid development of smart and intelligent structure has led to the application of piezoelectric patches in repairing techniques. The advantage of using piezoelectric patch is that its behavior can be controlled by considering its electromechanical properties. The piezoelectric patch that can be used for sensing and actuation make it suitable to be used in active repair. In this paper, an experimental approach of active repair on an edge crack specimen using two piezoelectric patches was carried out. To observe the effect of the active repair, the stress intensity factor (SIF) was measured using strain data that was obtained from the strain gages located near to the crack tip. The edge crack specimen was put under Mode 1 loading condition as the active repair using piezoelectric patches was applied. The results showed reduction of SIF from the effect of the active repair. © BEIESP.

Author keywords

Active repair | Edge crack | Modes | Piezoelectric

Funding details

Funding sponsor	Funding number	Acronym
International Islamic University Malaysia	RIGS17-045-0620	
International Islamic University Malaysia		

Funding text

The authors gratefully acknowledge the financial support by the Research Management Centre (RMC) at the International Islamic University Malaysia under the Research Initiative Grant Scheme (grant no.: RIGS17-045-0620). Also, the authors acknowledge the assistance and guidance from the technicians from the Electronic Lab and the Structural Lab.

ISSN: 22773878
Source Type: Journal
Original language: English
Document Type: Article
Publisher: Blue Eyes Intelligence Engineering and Sciences Publication

References (16)

View in search results format ›

All Export Print E-mail Save to PDF Create bibliography

1 Abuzaid, A., Hrairi, M., Dawood, M.S.I.S.
Survey of active structural control and repair using piezoelectric patches (Open Access)
(2015) *Actuators*, 4 (2), pp. 77-98. Cited 8 times.
http://www.mdpi.com/2076-0825/4/2/77/pdf
doi: 10.3390/act4020077
View at Publisher

2 Wang, Q., Quek, S.T., Liew, K.M.
On the repair of a cracked beam with a piezoelectric patch
(2002) *Smart Materials and Structures*, 11 (3), pp. 404-410. Cited 43 times.
doi: 10.1088/0964-1726/11/3/311
View at Publisher

3 Liu, T.J.-C.
Crack repair performance of piezoelectric actuator estimated by slope continuity and fracture mechanics
(2008) *Engineering Fracture Mechanics*, 75 (8), pp. 2566-2574. Cited 16 times.
doi: 10.1016/j.engfracmech.2007.11.004
View at Publisher

4 Koteswara, R.U., Nagaraju, C., Bangaru, B.P.
(2015) *Active Repair of Engineering Structures Using Piezoelectric Patches*
December

5 Liu, T.J.C.
Fracture mechanics and crack contact analyses of the active repair of multi-layered piezoelectric patches bonded on cracked structures
(2007) *Theoretical and Applied Fracture Mechanics*, 47 (2), pp. 120-132. Cited 21 times.
doi: 10.1016/j.tafmec.2006.11.004
View at Publisher

6 Abuzaid, A., Hrairi, M., Dawood, M.S.
Modeling approach to evaluating reduction in stress intensity factor in center-cracked plate with piezoelectric actuator patches
(2016) *J. Intell. Mater. Syst. Struct*, pp. 1-12.

7 Alaimo, A., Milazzo, A., Orlando, C.
Boundary elements analysis of adhesively bonded piezoelectric active repair
(2009) *Engineering Fracture Mechanics*, 76 (4), pp. 500-511. Cited 16 times.
doi: 10.1016/j.engfracmech.2008.10.008
View at Publisher