Document details

‹ Back to results | 1 of 1

International Journal of Engineering and Advanced Technology Open Access
Volume 8, Issue 3 Special Issue, February 2019, Pages 749-753

A new higher order theory for analysis of orthotropic cylindrical shell under electromechanical load (Article)

Adedi, M.R., Ali, J.S.M., Hrairi, M.

Department of Mechanical Engineering, International Islamic University, Malaysia

Abstract

View references (14)

In this work, the effect of electrical loads on the bending behavior of a simply supported cylindrical shell made of composite and piezoelectric layups have been considered. A new 8 terms higher order shear deformation theory (HSDT8) is proposed and used to analyze the problems. The HSDT8 is the extensional of FSDT by incorporating Murakami zig-zag function and higher order terms in the displacement model. Results are presented for mechanical and electromechanical loading for various layups and validated against available elasticity solutions. HSDT8 proves to be an accurate model for all cases, thin and thick laminate problems. © BEIESP.

SciVal Topic Prominence

Topic: Piezoelectricity | Vibration control | Piezoelectric layers

Prominence percentile: 91.853

Author keywords

Composite | Cylindrical shell | Higher order shear deformation theory | Piezoelectric

Funding details

Funding sponsor	Funding number	Acronym
Ministry of Higher Education, Malaysia	FRGS 16-066-0565	MOHE

Funding text

The authors would like to thank the Ministry of Higher Education, Malaysia for supporting this work through Research Grant FRGS 16-066-0565.

ISSN: 22498958
Source Type: Journal
Original language: English
Document Type: Article
Publisher: Blue Eyes Intelligence Engineering and Sciences Publication

References (14)

View in search results format >

1 Pagano, N.J.

Exact Solutions for Composite Laminates in Cylindrical Bending

(1969) *Journal of Composite Materials*, 3 (3), pp. 398-411. Cited 913 times.
doi: 10.1177/002199836900300304

View at Publisher

2 Bhaskar, K., Varadan, T.K.

Exact elasticity solution for laminated anisotropic cylindrical shells

(1993) *Journal of Applied Mechanics, Transactions ASME*, 60 (1), pp. 41-47. Cited 52 times.
doi: 10.1115/1.2900777

View at Publisher

3 Heyliger, P.

Exact solutions for simply supported laminated piezoelectric plates

(1997) *Journal of Applied Mechanics, Transactions ASME*, 64 (2), pp. 299-306. Cited 208 times.
doi: 10.1115/1.2787307

View at Publisher

4 Ren, J.G.

Exact solutions for laminated cylindrical shells in cylindrical bending

(1987) *Composites Science and Technology*, 29 (3), pp. 169-187. Cited 169 times.
doi: 10.1016/0266-3538(87)90069-8

View at Publisher

5 Ren, J.G.

Analysis of simply-supported laminated circular cylindrical shell roofs

(1989) *Composite Structures*, 11 (4), pp. 277-292. Cited 76 times.
doi: 10.1016/0263-8223(89)90092-5

View at Publisher

6 Chen, C.-Q., Shen, Y.-P., Wang, X.-M.

Exact solution of orthotropic cylindrical shell with piezoelectric layers under cylindrical bending

(1996) *International Journal of Solids and Structures*, 33 (30), pp. 4481-4494. Cited 79 times.
journals.elsevier.com/international-journal-of-solids-and-structures/
doi: 10.1016/0020-7683(95)00278-2

View at Publisher

7 Dumir, P.C., Dube And, G.P., Kapuria, S.

Exact piezoelastic solution of simply-supported orthotropic circular cylindrical panel in cylindrical bending

(1997) *International Journal of Solids and Structures*, 34 (6), pp. 685-702. Cited 53 times.
journals.elsevier.com/international-journal-of-solids-and-structures/
doi: 10.1016/S0020-7683(96)00047-9

View at Publisher