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Journal of Mechanical Science and Technology

Volume 30, Issue 1, 1 January 2016, Pages 77-87

The transverse shear deformation behaviour of magneto-electro-elastic shell (Article)

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Abstract

Compared to the large number of possible magneto-electro-elastic shell theories, very few exact solutions determining the in-plane stresses, electric displacements and magnetic inductions are possible. While, solving the magneto-electro-elastic shell equations in terms of thermo-magneto-electro-elastic generalized field functions on arbitrary domains and for general conditions exactly are not always possible. In the present work, a linear version of magneto-electro-elastic shell with simply supported boundary conditions, solved exactly, provided that the lamination scheme is cross-ply or anti-symmetric angle-ply laminates. The exact solution that introduced herein can measure the in-plane stresses, electric displacements and magnetic inductions. It also allow for an accurate and usually elegant and conclusive investigation of the various sensations in a shell structure. However, it is important for micro-electro-mechanical shell applications to have an approach available that gives the transverse shear deformation Behaviourfor cases that cannot examine experimentally. An investigated examples were accompanied and noteworthy conclusions were drawn which highlight the issues of the implementation of the exact solution, implication of the effects of the material properties, lay-ups of the constituent layers, and shell parameters on the static Behaviour. © 2016, The Korean Society of Mechanical Engineers and Springer-Verlag Berlin Heidelberg.

Author keywords

Exact solution; Laminated shell; Linear analysis; Smart composite; Structronic shell; Thermo-magneto-electro-elastic

Indexed keywords

Engineering controlled terms: Electric fields; Laminated composites; Laminates; Laminating; Shear deformation

Exact solution; Laminated shell; Linear analysis; Magneto electro elastic; Smart composites; Structronic shell

Engineering main heading: Shells (structures)

ISSN: 1738494X **Source Type:** Journal **Original language:** English

DOI: 10.1007/s12206-015-1209-4 **Document Type:** Article

Publisher: Korean Society of Mechanical Engineers

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