

[Get Access](#)[Export](#)

Composite Structures

Volume 96, February 2013, Pages 89-96

LS model on electro–magneto–thermoelastic response of an infinite functionally graded cylinder

Ibrahim A. Abbas ^{a, b}  , Ashraf M. Zenkour ^{c, d} 

 [Show more](#)

<https://doi.org/10.1016/j.compstruct.2012.08.046>

[Get rights and content](#)

Abstract

This article presents the electro–magneto–thermoelastic analysis problem of an infinite functionally graded material (FGM) hollow cylinder based upon Lord and Shulman’s (LS) theory. Material properties of the cylinder are assumed to be graded in the radial direction according to a novel power-law distribution in terms of the volume fractions of the metal and ceramic constituents. The inner surface of the FGM cylinder is pure metal whereas the outer surface is pure ceramic. The governing second-order differential equations are derived passed on the equations of motion and the heat-conduction equation. A finite element scheme is presented to obtain numerical solutions with high accuracy. The system of differential equations is solved numerically and some plots for displacement, radial stress, and temperature are presented. A comparison example with the available results is presented. The radial displacement, stresses and temperature are all investigated along the radial direction of the infinite cylinder.



[Previous](#)

[Next](#)



Keywords

Infinite cylinder; FGM; Electro–magneto–thermoelastic response; LS theory; Finite element method

[Recommended articles](#)

[Citing articles \(0\)](#)

Copyright © 2012 Elsevier Ltd. All rights reserved.

ELSEVIER

[About ScienceDirect](#) [Remote access](#) [Shopping cart](#) [Contact and support](#)
[Terms and conditions](#) [Privacy policy](#)

We use cookies to help provide and enhance our service and tailor content and ads. By continuing you agree to the [use of cookies](#).

Copyright © 2018 Elsevier B.V. or its licensors or contributors. ScienceDirect® is a registered trademark of Elsevier B.V.

 **RELX** Group™