

Transient Hygrothermoelastic Behavior in an Infinite Annular Cylinder with Internal Heat Generation by Linear Dependence Theory of Coupled Heat and Moisture

Authors : Tasneem Firdous Islam, G. D. Kedar

Abstract : The aim of this paper is to study the effect of internal heat generation in a transient infinitely long annular cylinder subjected to hygrothermal loadings. The linear dependence theory of moisture and temperature is derived based on Dufour and Soret effect. The meticulous solutions of temperature, moisture, and thermal stresses are procured by using the Hankel transform technique. The influence of the internal heat source on the radial aspect is examined for coupled and uncoupled cases. In the present study, the composite material T300/5208 is considered, and the coupled and uncoupled cases are analyzed. The results obtained are computed numerically and illustrated graphically.

Keywords : temperature, moisture, hygrothermoelasticity, internal heat generation, annular cylinder

Conference Title : ICAMM 2022 : International Conference on Applied Mechanics and Mathematics

Conference Location : Dubai, United Arab Emirates

Conference Dates : July 28-29, 2022