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Axisymmetric Distributions of Thick Circular Plate in a Modified Couple Stress Theory

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In this paper, the two-dimensional axisymmetric distributions of thick circular plate in modified couple stress theory with heat and mass diffusive sources is investigated. The problem is considered in the context of the theories of thermodiffusion elastic solid with one and two relaxation time developed by Sherief *et al.* [*Int. J. Eng. Sci.* **42**, 591 (2004)] and Kumar and Kansal [*Int. J. Solid Struct.* **45**, 5890 (2008)] by using Laplace and Hankel transforms technique. The displacements, stress components, temperature change and chemical potential are obtained in transformed domain. Particular cases of interest are also deduced.

Keywords: Modified couple stress; thermodiffusive elastic; axisymmetric heat sources; Laplace and Hankel transforms.

1. Introduction

Couple-stress theory is an extended continuum theory that includes the effects of a couple per unit area on a material volume, in addition to the classical direct and shear forces per unit area. The existence of couple-stress in materials was originally

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