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ELECTROMAGNETISM, OPTICS, ACOUSTICS, HEAT TRANSFER, CLASSICAL MECHANICS, AND FLUID DYNAMICS

Response of thermal source in a transversely isotropic thermoelastic half-space with mass diffusion by using a finite element method

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Abstract

The two-dimensional problem of generalized thermoelastic diffusion material with thermal and diffusion relaxation times is investigated in the context of the Lord—Shulman theory. As an application of the problem, a particular type of thermal source is considered and the problem is solved numerically by using a finite element method.

The components of displacement, stress, temperature distribution, chemical potential, and mass concentration are obtained. The resulting quantities are depicted graphically for a special model. An appreciable effect of relaxation times is observed on various resulting quantities.

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