عنوان مقاله:

Elasto-Thermodiffusive Response in a Two-Dimensional Transversely Isotropic Medium

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خلاصه مقاله:

The present article investigates the elasto-thermodiffusive interactions in a transversely isotropic elastic medium in the context of thermoelasticity with one relaxation time parameter and two relation time parameters. The resulting non-dimensional coupled equations are applied to a specific problem of a half-space in which the surface is free of tractions and is subjected to time-dependent thermal and chemical loadings. The analytical expressions for the displacement components, stresses, temperature, strain, mass diffusion, and chemical potential are obtained in the physical domain by employing the normal mode analysis as a tool. These expressions are calculated for a copper-like material and the results are depicted graphically. A comparative study of a diffusive medium and a thermoelastic medium show that diffusion has a significant effect on the thermophysical quantities. Furthermore, in the absence of the effect of thermodiffusion, the results agree with the existing literature.

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