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عنوان مقاله:

Analytical solution for axisymmetric thermoelastodynamic problem in a transversely isotropic half-space under a .surface dynamic loading

محل انتشار:

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خلاصه مقاله:

In the present study, the theory of coupled thermoelastodynamic is applied to determine the displacement, temperature and stress (DTS) fields of a torsionless axisymmetric transversely isotropic half-space under a surface loading. The basic equations of coupled thermoelasticity consist of the equations of motion and the energy equation, which forms a set of completely coupled partial differential equations for the displacement and temperature fields. Potential method is employed for uncoupling the set of basic equations of coupled thermoelasticity. With the aid of a potential function existed in the literature, the system of equations are uncoupled, where a sixth order partial differential equation is received. Displacement components and temperature are written with respect to the potential function in cylindrical coordinate system. The Laplace and Hankel integral transforms are employed to suppress the time and radial variables, respectively. One may apply the inverse Hankel and Laplace transforms to determine the DTS fields and other quantities of interest in physical (space-time) domain. Eventually, the integrand functions of DTS .components are obtained analytically

کلمات کلیدی:

thermoelasticity, transversely isotropic, axisymmetry, potential function, Laplace and Hankel transforms

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