EFFECT OF THREE-PHASE-LAG ON TWO-TEMPERATURE GENERALIZED THERMOELASTICITY FOR HOMOGENEOUS ISOTROPIC HALF SPACE

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Abstract

This paper deals with thermoelastic interaction due to thermal shock on the stress free boundary of a homogeneous isotropic half-space in the context of two-temperature generalized thermoelasticity with three-phase-lag effect. The basic equations in non-dimensional forms have been written in the form of vector-matrix differential equation in the Laplace transform domain. Then the said vector-matrix differential equation is solved by state space approach. Inversion of the Laplace transforms are computed numerically by applying the method of Fourier series expansion technique. The stress, strain, displacement and temperature distributions have been computed numerically and presented graphically in a number of figures. A comparison of the results for different theories (LS and TPL) are also presented for the different types of temperature field (one-temperature and two-temperature). All the numerical calculations are done using the material properties of copper (Cu) metal.

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