

Three-Dimensional Generalized Thermoelasticity with Variable Thermal Conductivity

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Abstract : In this paper, a three-dimensional model of the generalized thermoelasticity with one relaxation time and variable thermal conductivity has been constructed. The resulting non-dimensional governing equations together with the Laplace and double Fourier transforms techniques have been applied to a three-dimensional half-space subjected to thermal loading with rectangular pulse and traction free in the directions of the principle co-ordinates. The inverses of double Fourier transforms, and Laplace transforms have been obtained numerically. Numerical results for the temperature increment, the invariant stress, the invariant strain, and the displacement are represented graphically. The variability of the thermal conductivity has significant effects on the thermal and the mechanical waves.

Keywords : thermoelasticity, thermal conductivity, Laplace transforms, Fourier transforms

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