

Abstract

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A Mode-I Crack problem for an Infinite Space in Thermoelasticity.

A two-dimensional problem for an infinite space weakened by a finite linear opening Mode-I crack is solved. The solid material is assumed to be homogeneous and isotropic. The crack is subjected to prescribed temperature and stress distributions. A rectangular system of Cartesian coordinates is used. The Fourier transform technique is applied to solve the problem. The boundary conditions of the problem are then reduced to a system of two dual integral equations, which are solved analytically. Numerical values for the temperature, stress and displacements are obtained and represented graphically then discussed. All the definite integrals involved were calculated using Romberg technique of numerical integration with the aid of a Fortran program compiled with Visual Fortran v.6.1 on a Pentium-IV pc with processor speed 2.0 GHz.