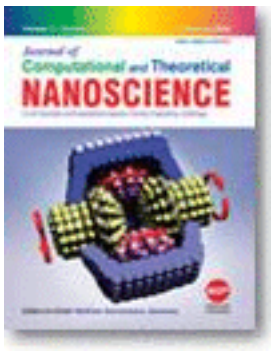

Semi-Analytical and Numerical Solution of Fractional Order Generalized Thermoelastic in a Semi-Infinite Medium

Authors: Abbas, Ibrahim A.; Zenkour, Ashraf M.

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Semi-analytical and numerical solutions are two basic tools in the study of thermoelastic interactions problems in anisotropic media. The present investigation deals with the thermoelastic interactions in a semi-infinite medium in the context of the theory of fractional order generalized thermoelasticity. The governing equations are expressed in Laplace transform domain and solved in the domain by analytical method and finite element method. The solutions of the problem in the physical domain are obtained by using a numerical method for the inversion of the Laplace transforms based on Stehfest's method. The displacement, temperature and stress distribution are obtained and presented graphically to illustrate the effect of fractional order derivatives. The accuracy of the finite element formulation was validated by comparing the analytical and numerical solutions for the field quantities.

Keywords: FINITE ELEMENT METHOD; FRACTIONAL ORDER; LAPLACE TRANSFORMS

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