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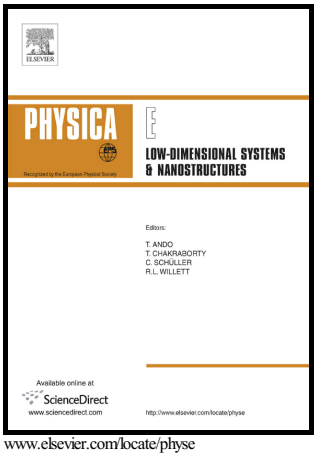


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# Analytical solution of thermoelastic interaction in a half-space by pulsed laser heating

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## Abstract:

In this article, we consider the problem of a two-dimensional thermoelastic half-space in the context of generalized thermoelastic theory with one relaxation time. The surface of the half-space is taken to be traction free and thermally insulated. The solution of the considered physical quantity can be broken down in terms of normal modes. The nonhomogeneous basic equations have been written in the form of a vector-matrix differential equation, which is then solved by an eigenvalue approach. The exact analytical solution is adopted for the temperature, the components of displacement and stresses. The results obtained are presented graphically for the effect of laser pulse to display the phenomena physical meaning. The graphical results indicate that the thermal relaxation time has a great effect on the temperature, the components of displacement and the components of stress.

**Keywords:** Analytical solution; thermoelasticity; Relaxation time; Eigenvalue approach; laser pulse.

## Introduction