

On the Propagation of Plane Waves under Strain Gradient Theory of Generalized Thermoelasticity

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ABSTRACT

The objective of the present article is to describe the propagation of harmonic plane waves in context of the strain gradient linear thermoelastic theory (SGT) and the Lord and Shulman theory of heat conduction. The exact dispersion relation solutions for the longitudinal plane wave are derived analytically. Several characterizations of the wave fields, like phase velocity, specific loss, and penetration depth, are obtained. Numerical results are presented to show the gradient effect on the wave field. The validity of numerical findings of different characterizations works have been deduced, and a comparison is made with some earlier work.

Keywords: Plane harmonic waves; Dispersion relation; Strain gradient linear Thermoelasticity theory; Generalized Thermoelasticity.

