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SOME CONSIDERATION ON THE RAYLEIGH-LAMB WAVES PROPAGATION IN MICROPOLAR GENERALIZED THERMOELASTIC PLATES

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Abstract

The propagation of waves in micropolar thermoelastic plate subjected to stress free isothermal and thermally insulated conditions is investigated in the context of conventional coupled thermoelasticity (CT), Lord-Shulman (LS), and Green-Lindsay (GL) theories of thermoelasticity. The secular equations for symmetric and skew-symmetric modes of wave propagation in a micropolar thermoelastic plate in completely separate terms are derived. The secular equations for micropolar coupled thermoelastic, micropolar elastic, thermoelastic and elastic plates have been deduced as particular cases. At short wave length limits, the secular equations in case of stress free, thermally insulated and isothermal, micropolar, thermoelastic plate reduce to Rayleigh surface waves frequency equation, because the finite thickness plate in such situations appears to be a semi-infinite medium and hence vibrational energy is transmitted mainly along the surface of the solid. Finally, in order to illustrate the analytical development, the numerical solution is carried out for Magnesium composite material. The theory and numerical computations are found to be in close agreement.