Title: **32. Two-dimensional generalized thermo-elastic problem for anisotropic half-space**
Author(s): Debkumar Ghosh, Abhijit Lahiri, and Ibrahim A. Abbas .
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Abstract. This paper concerns with the study of wave propagation in fibre reinforced anisotropic half space under the influence of temperature and hydrostatic initial stress. Lord-Shulman theory is applied to the heat conduction equation. The resulting equations are written in the form of vector matrix differential equation by using Normal Mode technique, finally which is solved by Eigen value approach. Keywords: eigenvalue, generalized thermoelasticity, normal mode, vector-matrix differential equation. 1. Introduction Fibre-reinforced composite(FRC) materials are usually low weight and high strength used in construction engineering. The physical property of FRC material is governed by the theory of elasticity for different materials with the direction along the direction of fibre. Green [1] studied wave propagation in anisotropic elastic plates. Abbas and Othman [2] discussed the distribution of wave propagation under hydrostatic initial stress of fibre-reinforced materials in anisotropic half-space. Baylies and Green [3] analyse the flexural waves in fibre-reinforced laminated plates. Rogerson [4] discussed effect of penetration in a six-ply composite laminates. Most of the thermoelasticity and generalized thermoelasticity (coupled or uncoupled) problems have been solved by potential function approach. This method is not always suitable as discussed by Dhaliwal and Sherief [5] and Sherief and Anwar [6]. These may be summarized by the initial conditions and the boundary conditions for physical problems which are directly concern with the material quantities under consideration and not with the potential function. Also, the potential function representations are not convergent always while the physical problems in natural variables constitute convergent solution. So, the alternative method of potential function approach is eigenvalue approach. In this method, we obtain a vector-matrix differential equation from the basic equations which reduces finally to an algebraic eigenvalue problem and the solutions for the field variables are obtained by determining the eigenvalues and eigenvectors from the corresponding coefficient matrix. In this theory, body forces and/or heat sources are also accommodated as in Das and Lahiri [7], Bachher et al. [8]. Now, two different models of generalized thermoelastisities are extensively used. One is Lord and Shulman (L-S) [9] theory and the other is Green and Lindsay (G-L) [10] theory. Introducing one relaxtion time parameter in L-S theory the heat conduction equation becomes hyperbolic type without violating conventional Fourier's law. Whereas the G-L theory modified the heat conduction equation as well as the equation of motion in coupled thermoelasticitywo relaxation time parameters. There are other three models (Model I, II and III by Green and Nagdhi [11-13]) for generalized thermoelasticity concerned to the theory of with or without energy dissipation. 2. Development of governing equations The stress-strain relation and the governing equations of motion without body forces and heat sources are written as follow: [[sigma].sub.ij,j] - P[[omega].sub.ij,j] = [rho][u.sub.i], (1) [[sigma].sub.ij] = [lambda][e.sub.kk][[delta].sub.ij] + 2[[mu].sub.T][e.sub.ij] + [alpha]([a.sub.k][a.sub.m][e.sub.km][[delta].sub.ij] + [a.sub.i][a.sub.j][e.sub.KK]) +2([[mu].sub.L] - [[mu].sub.T])([a.sub.i][a.sub.k][e.sub.kj] + [a.sub.j][a.sub.k][e.sub.ki]) + [beta][a.sub.k][a.sub.m][e.sub.km][a.sub.i][a.sub.j] - [[beta].sub.ij](T - [T.sub.0])[[delta].sub.ij], i, j, k, m = 1,2,3, (2) [e.sub.ij] = [1/2]([u.sub.i,j] + [u.sub.j,i]), (3) [w.sub.ij] = [1/2]([u.sub.j,i] - [u.sub.i,j]), (4) [K.sub.ij][T.sub.ij] = [rho][c.sub.e]([??] + [t.sub.0][??]) + [[??].sub.0]([[??].sub.i,j][[??].sub.i,j]), i,j = 1,2,3. (5) We consider...