BOUNDARY AND EIGENVALUE PROBLEMS FOR ANISOTROPIC
PLATES WITH SEVERAL INTERNAL LINE HINGES

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Abstract.

The present paper deals with the free transverse vibration of a tapered anisotropic plate with several arbitrarily located internal line hinges and non-smooth boundary, elastically restrained against rotation and translation.

The equations of motion and its associated boundary and transition conditions are rigorously derived using Hamilton's principle. The governing eigen value problem is solved employing a combination of the Ritz method and the Lagrange multipliers method.

The deflections of the plate and the Lagrange multipliers are approximated by polynomials as coordinate functions. The developed algorithm allows obtaining approximate solutions for plates with different geometries and boundary conditions, including edges and line hinges elastically restrained.

In order to obtain an indication of the accuracy of the developed mathematical model, some cases available in the literature are considered. New results are presented for different boundary conditions and restraint conditions in the internal line hinges.

Palabras clave: An isotropicp lates, internal line hinges, vibrations.