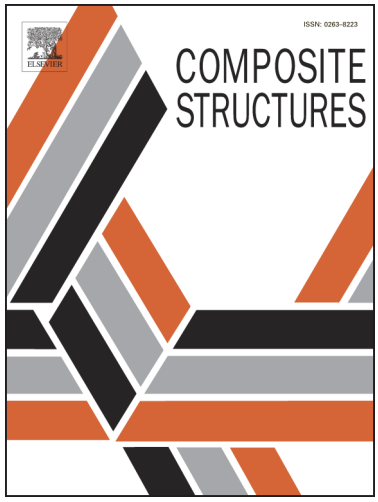

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Free vibration of layered truncated conical shells filled with quiescent fluid using spline method

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Abstract

Free vibration of layered truncated conical shells filled with quiescent fluid using spline method is studied. Love's first approximation theory is used to formulate the equations of motion of truncated conical shells. Velocity potential and Bernoulli's equations have been applied for the expression of the pressure of the fluid. The fluid is assumed to be incompressible, inviscid and quiescent. The solutions of displacement functions are assumed in a separable form to obtain a system of coupled differential equations in terms of displacement functions. The displacement functions are approximated by Bickley-type splines to obtain the generalized eigenvalue problem by combining with boundary conditions. A generalized eigenvalue problem is obtained and solved numerically for frequency parameter and an associated eigenvector of spline coefficients. Two layered shells are considered. Parametric studies are made to investigate the effect of fluid on the frequencies with respect to the relative layer thickness, semi cone angle and length ratio.

Keywords
Conical shell, quiescent fluid, eigenvalues, spline

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