

A variational approach to vibrations of laminated composite plates with a line hinge

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Abstract

A Ritz variational approach for the analysis of free vibration of plates with internal hinges distributed along a straight line is presented. The plate is modeled with the first order shear deformation theory and symmetric stacking sequences. The line with hinges is modeled by using subdomain decomposition of the plate coupled with penalty techniques, which causes an increment of the variational statement to assure the continuity conditions along the contact boundary of the plate's subdomains. In order to obtain an indication of the accuracy of the developed mathematical model and the proposed technique, some cases available in the literature have been considered. Original results are presented for solution of representative symmetric multilayered plates showing the effects of the line hinge parameters on the natural frequencies and mode shapes.

Palabras Claves: FSDTLaminatedplateLinehingeRitz