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Buckling analysis of laminated composite box beams

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ABSTRACT

Paper presents buckling analysis of thin-walled laminated composite box beam-type structures. The non-linear displacement field of thin-walled cross-section is adopted in order to insure the geometric potential of semi-tangential type for both the internal torsion and bending moments. The cross-section mid-line contour is assumed to remain not deformed in its own plane, and the shear strains of middle surface are neglected. The laminates are modeled on the basis of classical lamination theory. Analysis is performed in an eigenvalue manner, and it attempts to determine the critical loads as well as corresponding buckling modes in a direct manner without calculating the deformations. The model is validated on a few test examples comparing the results with those reported in the literature.

KEYWORDS: composite, box beams, buckling