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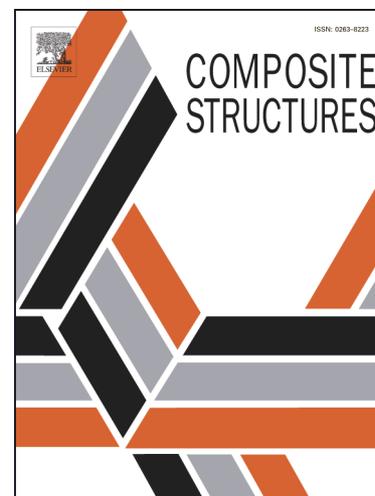
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INFLUENCE OF MECHANICAL COUPLINGS ON THE BUCKLING BEHAVIOUR OF THIN-WALLED PLATES MADE OF GENERAL LAMINATES UNDER COMPRESSION

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ABSTRACT

The present paper deals with the buckling and post-buckling behaviour of plates made of coupling laminates (the so-called general laminates). Such laminates consist of a number of layers arranged in an arbitrarily way. Thus, the sequences of laminated layers are non-symmetric. In this case, the coupling between tension, flexure, shearing and twisting takes place. The behaviour of general laminates substantially differs from that of laminates with a symmetric layup or isotropic materials. Therefore, they undergo out-of-plane deformation (i.e., warping, bending and/or twisting) when exposed to in-plane loads. Due to a wide range of application possibilities for general laminates, it is worth focusing on their advantages.

The analytical-numerical method (ANM) based on Koiter's theory was used to determine the static buckling loads and post-buckling equilibrium behaviour. In order to obtain the equations of equilibrium for plates, the classic laminate theory was used. The plate displacements were considered within the nonlinear geometrical relations. For special laminates (i.e., regular anti-symmetric angle-ply laminates), there are closed-form solutions of the equilibrium equations of the

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