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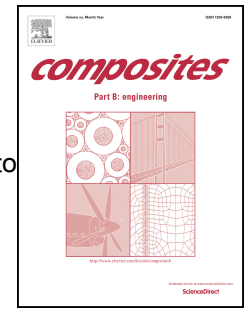

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Mechanical behavior of laminated CNT-reinforced composite skew plates subjected to dynamic loading

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Abstract

This paper presents the first known mechanical behavior of laminated CNT-reinforced composite skew plates subjected to a transverse sudden dynamic load. The plate is composed of multilayers of nanocomposite reinforced with single-walled carbon nanotubes (SWCNTs). The problem is formulated using the first-order shear deformation theory (FSDT), and solution to the problem is obtained through the element-free IMLS-Ritz method. The elastodynamic behavior is furnished by employing the Newmark-β method. Material properties of CNT-reinforced composites are predicted through the Mori–Tanaka approach. The stability and precision of the IMLS-Ritz method are validated by convergence and comparison studies. The effects of skew angles, width-to-thickness ratio, CNT-volume fraction, CNT-distribution along the layer thickness, CNT-fiber orientation and boundary conditions on the elastodynamic responses of laminated CNT-reinforced composite skew plates are examined.

Keywords: CNT-reinforced composites; elastodynamic; dynamic loading; laminated skew plates; IMLS-Ritz method

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