

Effect of Normal Deformation on the Stability of Sandwich Beams Simply Supported Using a Refined Four-Variable Beam Theory

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Abstract : In this work, a study of the stability of a functionally graduated sandwiches beam using a refined theory of hyperbolic shear deformation of a beam was developed. The effects of transverse shear strains and the transverse normal deformation are considered. The constituent materials of the beam are supposed gradually variable depending on the height direction based on a simple power distribution law in terms of the volume fractions of the constituents; the two materials with which we worked are metals and ceramics. In order to examine the present model, illustrative examples are presented to show the effects of changes in different parameters such as the material graduation, the stretching effect of the thickness and thickness ratio -length on the buckling of FGM sandwich beams.

Keywords : FGM materials, refined shear deformation theory, stretching effect, buckling, boundary conditions

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