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Thermal Postbuckling of First Order Shear Deformable Functionally Graded Plates

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Abstract : This paper presents an analytical investigation on the buckling and postbuckling behaviors of thick functionally graded plates subjected to thermal load .Material properties are assumed to be temperature dependent, and graded in the thickness direction according to a simple power law distribution in terms of the volume fractions of constituents. The formulations are based on first order shear deformation plate theory taking into account Von Karman nonlinearity and initial geometrical imperfection. By applying Galerkin method, closed-form relations of postbuckling equilibrium paths for simply supported plates are determined. Analysis is carried out to show the effects of material and geometrical properties, in-plane boundary restraint, and imperfection on the buckling and postbuckling loading capacity of the plates.

Keywords : functionally graded materials, postbuckling, first order shear deformation theory, imperfection
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