

POST-BUCKLING BEHAVIOUR OF AXIALLY FGM PLANAR BEAMS AND FRAMES

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ABSTRACT

Post-buckling analysis of planar beams and frames made of axially Functionally Graded Material (FGM) by using the finite element method is presented. The material property of the beams is assumed to vary linearly along the axis of beam direction. A non-linear beam element based on Timoshenko beam theory is formulated in the context of the co-rotational formulation. The non-linear equilibrium equations are solved by using the incremental/iterative procedure in combination with the arc-length control method. The obtained results are compared with the published references to verify the accuracy of the proposed formulation and the numerical procedure. The effect of the material distribution on the post-buckling response of the axially FGM structures is highlighted.