عنوان مقاله:

A Innovative Efficient Element for Analysis of Axially FGM Tapered Beams Using FEM

محل انتشار:

دهمین کنگره بین المللی مهندسی عمران (سال: 1394)

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خلاصه مقاله:

This paper aims at presenting a new efficient element for free vibration of Axially Functionally Graded Materials (FGMs) non-prismatic beams using Finite Element Method (FEM). Using concept of Basic Displacement Functions (BDFs), two- node element extends to three-node element for obtaining much more exact results using FEM. First, BDFs are introduced and computed using energy method such as unit-dummy load method. Afterward, new shape functions are developed in terms of BDFs during the procedure based on the mechanical behavior of the element in which presented shape functions benefit generality and accuracy from stiffness and force method, respectively. Finally, deriving structural matrices of the beam with respect to new shape functions; free vibration of the FGM beam is studied using finite element method for all types of AFGM beams and the convergence of FEM has been studied. The results from free vibration is in perfect agreement with those of previously published

کلمات کلیدی:

Axially Functionally Graded Materials (AFGM), Finite Element Method (FEM), Basic Displacement Functions (BDFs), Free Vibration

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