عنوان مقاله:

Dynamic buckling of bi-directional functionally graded porous Timoshenko nanobeam

محل انتشار:

نهمین کنفرانس بین المللی آکوستیک و ارتعاشات (سال: 1398)

تعداد صفحات اصل مقاله: 12

نویسندگان:

Farshid Allahkarami - *Department of Mechanical Engineering, Bijar Branch, Islamic Azad University, Bijar, Iran*

Maryam Ghassabzadeh Saryazdi - *Vehicle Technology Research Institute, Amirkabir University of Technology, Tehran, Iran*

Hasan Tohidi - *Department of Mechanical Engineering, Saqqez Branch, Islamic Azad University, Saqqez, Iran*

خلاصه مقاله:

The present research deals with dynamic buckling of bi-directional functionally graded nanobeam considering porosity effect. It is assumed that the material characteristics of nanobeam changes ac-cording to modified power -law model along thickness and length for Even and Uneven distributions of porosity patterns which are represented by bi-directional trigonometric functions. Nonlocal theo-ry has been used for modeling the structure and attaining strain-stresses. The motion equations are derived based on Hamilton s principle. Moreover, generalized differential quadrature method in conjunction with Bolotin method are employed to obtain instability region. The influences of Non-local parameter, power-law indexes and porosity volume fraction over the dynamic instability re-gion are studied. According to the obtained results, it is observed that the nonlocal beam model has an under-estimate prediction for the dynamic instability regions of BD-FG nanobeam. Furthermore, it is seen that the effect of the coefficient of Even porosity on dynamic instability remarkably de-pends on the values of volume fraction indexes which causes increment or decrement of excitation frequencies.

کلمات کلیدی:

Dynamic buckling; Bi-directional; Nonlocal theory; nanobeam.

لینک ثابت مقاله در پایگاه سیویلیکا:

https://civilica.com/doc/976099