

عنوان مقاله:

Free Vibration Analysis of BNNT with Different Cross-Sections via Nonlocal FEM

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خلاصه مقاله:

In the present study, free vibration behaviors of carbon nanotube (CNT) and boron nitride nanotube (BNNT) have been investigated via Eringen's nonlocal continuum theory. Size effect has been considered via nonlocal continuum theory. Nanotubes have become popular in the world of science thanks to their characteristic properties. In this study, free vibrations of Boron Nitride Nanotube (BNNT) and Carbon Nanotube (CNT) are calculated using the Nonlocal Elasticity Theory. Frequency values are found via both analytical and finite element method (FEM). Galerkin weighted residual method is used to obtain the finite element equations. BNNT and CNT are modeled as Euler - Bernoulli Beam and solutions are gained by using four different cross-section geometries with three boundary conditions. Selected geometries are circle, rectangle, triangle, and square. Frequency values are given in tables and graphs. The effect of cross-section, boundary conditions and length scale parameter on frequencies has been investigated in detail for BNNT.

کلمات کلیدی:

Nonlocal Elasticity Theory, Euler-Bernoulli Beam, Boron Nitride Nanotube, Carbon Nanotube, Finite Element Method

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