عنوان مقاله:

Bending vibration of single-walled carbon nanotubes using doublet mechanics

نویسنده:

Alireza Fatahi-Vajari - *Department of Mechanical Engineering, Langarud Branch, Islamic Azad University, Langarud, Iran*

خلاصه مقاله:

This paper investigates the bending vibration of single-walled carbon nanotubes based on a new theory called doublet mechanics with a scale parameter. A sixth order partial differential equation that governs the bending vibration for such nanotubes is derived. Using DM, the relation between natural frequency and scale parameter is derived in the bending vibration mode. It is proven that scale parameter plays significant role in the vibration behavior of such nanotubes in lateral direction. Such effect decreases the natural frequency compared to the predictions of the classical continuum mechanics models. However, with increasing the tube length, the scale effect on the natural frequency decreases. It is the first time that DM is used to model the bending vibration of carbon nanotube.

کلمات کلیدی:

doublet mechanics, natural frequency, free bending vibration, scale parameter, single-walled carbon nanotubes