

## عنوان مقاله:

On The Free Vibration of Doubly Clamped Single-Walled Coiled Carbon Nanotubes: A Novel Size Dependent Continuum Model

## محل انتشار:

فصلنامه مکانیک جامد، دوره 13، شماره 2 (سال: 1400)

تعداد صفحات اصل مقاله: 20

## نویسندگان:

F Darvishi - *Department of Mechanical Engineering, University of Zanjan, Zanjan, Iran*

O Rahmani - *Department of Mechanical Engineering, University of Zanjan, Zanjan, Iran*

## خلاصه مقاله:

In this paper, the size dependent vibration behavior of doubly clamped single-walled coiled carbon nanotubes (CCNTs) is investigated using nonlocal helical beam model. This model is based on Washizu's beam theory so that all displacement components of CCNT in the equations of motion are defined at the centroidal principal axis and transverse shear deformations are considered. After deriving the nonlocal free vibration equations, they are solved by the generalized differential quadrature method (GDQM). Then, the natural frequencies and corresponding mode shapes are determined for the clamped-clamped boundary conditions (BCs). After that, a parametric study on the effect of different parameters, including the helix cylinder to the tube diameters ratio, the number of pitches, the helix pitch angle, and the nonlocal parameter on the natural frequencies is conducted. It is worth noting that the results of the proposed method would be useful in the practical applications of CCNTs such as using in nanoelectromechanical systems.

## کلمات کلیدی:

Free vibration, Coiled carbon nanotubs, Helical spring model, Nonlocal elasticity theory, Differential quadrature method

## لینک ثابت مقاله در پایگاه سیویلیکا:

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