

عنوان مقاله:

Differential Quadrature Method for Dynamic Buckling of Graphene Sheet Coupled by a Viscoelastic Medium Using Neperian Frequency Based on Nonlocal Elasticity Theory

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نویسندگان:

Mohammad Malikan - *Department of Mechanical engineering, faculty of engineering, Islamic Azad University, Mashhad branch, Iran*

Mohammad Naser Sadraee Far - *Department of mechanical engineering, Islamic Azad university, Mashhad*

خلاصه مقاله:

In the present study, the dynamic buckling of the graphene sheet coupled by a viscoelastic matrix was studied. In light of the simplicity of Eringen's non-local continuum theory to considering the nanoscale influences, this theory was employed. Equations of motion and boundary conditions were obtained using Mindlin plate theory by taking nonlinear strains of von Kármán and Hamilton's principle into account. On the other hand, a viscoelastic matrix was modeled as a three-parameter foundation. Furthermore, the differential quadrature method was applied by which the critical load was obtained. Finally, since there was no research available for the dynamic buckling of a nanoplate, the static buckling was taken into consideration to compare the results and explain some significant and novel findings. One of these results showed that for greater values of the nanoscale parameter, the small scale had further influences on the dynamic buckling.

کلمات کلیدی:

Dynamic buckling, Graphene sheet, Viscoelastic matrix, Differential quadrature method

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