

### عنوان مقاله:

Temperature Effect on Vibration Analysis of Annular Graphene Sheet Embedded on Visco-Pasternak Foundati

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#### خلاصه مقاله:

In this study, the vibration behavior of circular and annular graphene sheet embedded in a Visco-Pasternak foundation and coupled with temperature change and under in-plane pre-load is studied. The single-layered annular graphene sheet is coupled by an enclosing viscoelastic medium which is simulated as a Visco- Pasternak foundation. By using the nonlocal elasticity theory and classical plate theory, the governing equation is derived for single-layered graphene sheets (SLGSs). The closed-form solution for frequency vibration of circular graphene sheets has been obtained and nonlocal parameter, in-plane pre-load, the parameters of elastic medium and temperature change appears into arguments of Bessel functions. To verify the accuracy of the present results, the new version differential quadrature method (DQM) is also developed. Closed-form results are successfully verified with those of the DQM results. The results are subsequently compared with valid result reported in the literature. The effects of the small scale, pre-load, mode number, temperature change, elastic medium and boundary conditions on natural frequencies are investigated. The non-dimensional frequency decreases at high temperature case with increasing the temperature change for all boundary conditions. The effect of temperature change on the non-dimensional frequency vibration becomes the opposite at high temperature case in compression with the low temperature case. The present research work thus reveals that the nonlocal parameter, boundary conditions, temperature change and initial pre-load have significant effects on vibration response of the circular nanoplates. The present analysis results can be used for the .design of the next generation of nanodevices that make use of the thermal vibration properties of the graphene

## کلمات کلیدی:

Vibration, Annular graphene sheet, Temperature change, In-plane pre-load

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