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## Forced vibration of nanoplate on viscoelastic substrate with consideration of structural damping: An analytical solution

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### Abstract

Based on nonlocal theory, this article discusses forced vibration of visco-nanoplate resting on viscoelastic medium. Single layer viscoelastic graphene sheet (SLVGS) modeled as visco-nanoplate. This model is aimed at representing dynamic interactions in nanocomposite materials with dissipation effect. By considering the Kirchhoff plate theory and viscoelastic Kelvin Voigt model, the governing equation is derived using Hamilton's principle. The equation is solved analytically to obtain the response of VGS. The parametric study is thoroughly performed, concentrating on the series effects of nonlocal parameter, viscoelastic damping structure, aspect ratio, visco-Pasternak (VP) medium, mode number and Quality factor (Q). In this study, both dimensional and nondimensional calculations are investigated. The numerical results of this article show a perfect correspondence with those of the previous researches.

### Keywords

Forced vibration; Dynamic response; Nanoplate; Damping effects; Nonlocal theory; Analytical solution.

### 1. Introduction

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