

## عنوان مقاله:

Frequency Analysis of Embedded Orthotropic Circular and Elliptical Micro/Nano-Plates Using Nonlocal Variational Principle

## محل انتشار:

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## خلاصه مقاله:

In this paper, a continuum model based on the nonlocal elasticity theory is developed for vibration analysis of embedded orthotropic circular and elliptical micro/nano-plates. The nano-plate is bounded by a Pasternak foundation. Governing vibration equation of the nonlocal nano-plate is derived using Nonlocal Classical Plate Theory (NCPT). The weighted residual statement and the Galerkin method are applied to obtain a Quadratic Functional. The Ritz functions are used to form an assumed expression for transverse displacement which satisfies the kinematic boundary conditions. The Ritz functions eliminate the need for mesh generation and thus large degrees of freedom arising in discretization methods such as Finite Element Method (FEM). Effects of nonlocal parameter, lengths of nano-plate, aspect ratio, mode number, material properties and foundation parameters on the nano-plate natural frequencies are investigated. It is shown that the natural frequencies depend on the non-locality of the micro/nano-plate, especially at small dimensions.

## کلمات کلیدی:

Nonlocal elasticity theory, Frequency Analysis, Elliptical nano-plate, Variational principle

## لینک ثابت مقاله در پایگاه سیویلیکا:

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