عنوان مقاله:

Exact solution for free vibration of nanoplates via nonlocal first-order shear deformation plate theory

محل انتشار:

دومین کنفرانس بین المللی و سومین همایش ملی کاربرد فناوری های نوین در علوم مهندسی (سال: 1394)

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خلاصه مقاله:

In this paper, free vibration of nanoplate based on Eringen nonlocal elasticity theory and displacement field of first-order shear deformation plate theory (FSDT) are investigated. The governing equations of motion and corresponding boundary conditions are derived using Hamilton’s principle. Introducing an auxiliary function, an exact method is employed to analytically solve the coupled equations of motion for boundary conditions of simply supported at two opposite sides and arbitrary boundary conditions for the other two sides (Levy-type boundary conditions). In a comprehensive study, the effects of parameters such as nonlocal parameter, aspect ratio, thickness to length ratio, mode number, boundary conditions and also length of nanoplate are examined on the dimensionless natural frequency.

کلمات کلیدی:

Nanoplate, nonlocal elasticity theory, natural frequency, Levy-type boundary conditions