Advances in Nano Research
Volume 10, Number 4, April 2021 , pages 313-325
DOI: https://doi.org/10.12989/anr.2021.10.4.313

Boundary conditions effect for buckling analysis of porous functionally graded nanobeam

Abdelhakim Bouhadra, Abderrahmane Menasria and Mohamed Ali Rachedi

Abstract

This paper is concerned with the buckling behavior of 2D and quasi-3D problem of functionally graded nanobeam founded on high order shear deformation beams theory and made by two different types of porous distribution materials in Nano- and micro-scales. The used Quasi-3D formulation takes into account the transverse shear effect and uses only three variables. Both formulations do not include the correction factor that is required in the first shear deformation theory proposed by Timoshenko. Governing equations are derived using the principle of virtual work. Analytical resolutions for buckling of FG nanobeam are introduced under tow different boundary conditions, and the results obtained are compared to those proposed in literatures.

Key Words

buckling; functionally graded material; porous materials; nanobeam