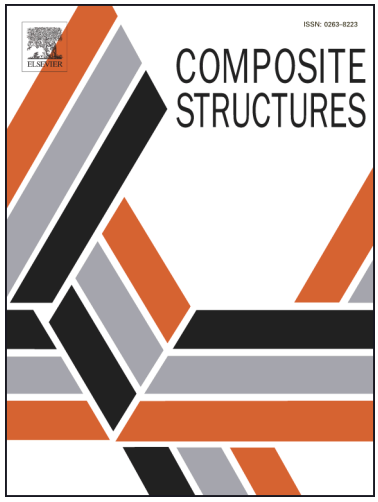


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PII: S0263-8223(18)30334-9
DOI: https://doi.org/10.1016/j.compstruct.2018.03.079
Reference: COST 9526

To appear in: *Composite Structures*

Received Date: 21 January 2018
Revised Date: 13 March 2018
Accepted Date: 20 March 2018

Please cite this article as: Lei, Z., Su, Q., Zeng, H., Zhang, Y., Yu, C., Parametric studies on buckling behavior of functionally graded graphene-reinforced composites laminated plates in thermal environment, *Composite Structures* (2018), doi: https://doi.org/10.1016/j.compstruct.2018.03.079

# Parametric studies on buckling behavior of functionally graded graphene-reinforced composites laminated plates in thermal environment

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**Abstract:**

This paper investigates buckling behavior of functionally graded graphene-reinforced composite (FG-GRC) laminated plates. The extended Halpin-Tsai model is used to estimate the effected material properties of the GRCs. The effects of rotary inertia and transverse shear deformation are incorporated by the first-order shear deformation theory (FSDT). Using the meshless kp-Ritz method, the buckling solutions are obtained. In order to derive the discretized eigenvalue equation, the kernel particle approximation is employed in the field variables and the energy functional is minimized through the Ritz procedure. The stability and accuracy of the meshless kp-Ritz method is verified through comparison and convergence studies by considering the effect of support size and number of nodes. The effects of boundary temperature, distribution of graphene, plate width-to-thickness ratio, plate aspect ratio and number of layers are investigated by detail parametric studies. Besides, the influences of boundary conditions, the types of buckling load and lamination angle are considered in this paper.

**Keywords**: Graphene, Meshless, Kp-Ritz, FSDT, Extended Halpin-Tsai model

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