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A Study on Axisymmetric Vibrations of Linearly Varying Annular FGM Plate Resting on Winkler Foundation

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ABSTRACT

In the present article, the effect of Winkler foundation has been analysed on the radially symmetric vibrations of functionally graded annular plate on the basis of classical plate theory. The thickness of the plate is varying linearly along the radial direction. The power law has been used to form a composition of ceramic and metal in the FGM plate. The materials properties i.e. Young's modulus and density of FGM are considered to be varying along the thickness direction. Hamilton's principal has been used to drive the governing differential equation for an annular plate which is clamped at the inner and outer boundaries. After that, a semi-analytic technique i.e. differential transform method has been applied to obtain the frequency equation. The effect of different parameters like foundation parameter, tapper parameter, volume fraction index and radii ratio has been analysed on the frequency parameter. The comparison of the obtained numerical results with the previous literature results shows the effectiveness of current numerical technique.

Keywords: FGM; axisymmetric vibration; annular plate

How to Cite

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