**A two-variable model for analyzing vibrations in functionally graded porous beams with different boundary conditions**

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**Abstract.** A novel two-dimensional elasticity solution for the vibration analysis of functionally graded porous (FGP) beams is presented in this study. Three different forms of porosity distribution are studied. In the thickness and axial directions, the kinematics of a beam with just two variables are increased in a hybrid form using polynomial and trigonometric series, respectively. The characteristic equations of the beams are then derived using Lagrange's equations. The numerical findings for the natural frequencies of FG beams are compared to earlier research. The impact of the power-law index and the length-to-depth ratio on the findings is explored.

**Keywords:** FGP beams; Vibration; Novel two-dimensional elasticity solution.