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Dynamics analysis of functionally graded porous (FGP) circular, annular and sector plates with general elastic restraints

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ABSTRACT:

In this paper, the dynamics analysis of functionally graded porous (FGP) circular, annular and sector plates with general elastic restraints is performed in a unified form for the first time. The overall theoretical model is based on the first order shear deformation theory. The kinetic energy and potential energy function of the plates are unified representation of five kinds of displacement admissible function. Then, each of displacement admissible function is expanded as a modified Fourier series to obtain general elastic restraints. Lastly, the solutions are obtained by using the variational operation. The convergence and accuracy of the present modeling are validated by comparing its results with those available in the literature and FEM results. Based on that, a series of innovative results are also highlighted in the text, which may be as the basic data for other algorithm research in the future.

Keywords：Dynamics analysis; functionally graded porous; circular, annular and sector plates; modified series solution; general elastic restraints.

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