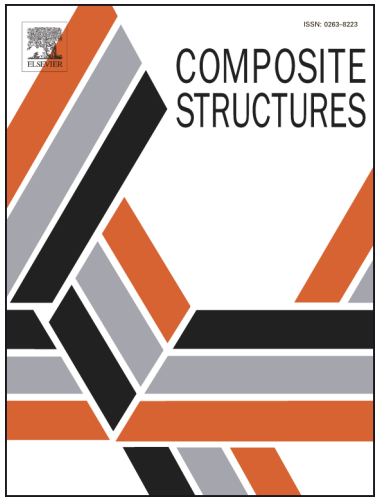

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Free vibration analysis of coupled functionally graded (FG) doubly-curved revolution shell structures with general boundary conditions

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ABSTRACT:

In this paper, free vibration behavior of coupled functionally graded (FG) doubly-curved revolution shell structures with general boundary conditions is studied by the using unified Jacobi-Ritz Method. The first-order shear deformation theory in conjunction with a multilevel partition technique is adopted to establish the theoretical model. The substructure of the theoretical model mainly includes the FG elliptical, hyperbolical, paraboloidal and cylindrical shells and three kinds of coupled FG shell structures containing paraboloidal-cylindrical shells, elliptical-cylindrical shells and hyperbolical-cylindrical shells are also considered in actual calculation. To obtain the continuous conditions at the interface and satisfy the arbitrary boundary conditions, the boundary and coupling spring techniques are adopted in this paper. In despite of the shell components and the boundary conditions, a mix function which is with the Jacobi polynomials along the meridional direction and the standard Fourier series along the circumferential direction is used as the admissible displacements of each shell segment. The convergence and comparison studies for the FG doubly-curved revolution shell structures with different boundary conditions, coupling parameters and Jacobi parameters are carried out to verify the reliability and accuracy of the present

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