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Influence of manufacturing defects on modal properties of composite pyramidal truss-like core sandwich cylindrical panels

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Abstract

Defects can easily appear in composite lattice truss core sandwich structures during the complex preparation process, which may significantly affect the structural response and decrease the load-carrying capability. The purpose of this paper is to investigate the manufacturing defect sensitivity of modal vibration responses of carbon fiber composite pyramidal truss-like core sandwich cylindrical panels by modal experiments and finite element analysis. Defects including debonding between face sheets and truss cores (DFT), truss missing (DTM), face sheet wrinkling (DFW) and gap reinforcing (DGR) are introduced into the present intact specimen artificially and modal testing is conducted to study their dynamic behavior under free-free boundary conditions. Finite element models consistent with the experiments are then developed to further study the effect of defect extents, locations and forms on the modal parameters of the present sandwich cylindrical panels. Results indicate that the degree of sensitivity of natural

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