

Dynamic mechanical behavior of lattice sandwich structures

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Sandwich plate and shell, as a kind of structure with excellent mechanical performances, has been playing extremely important roles in national economy and national defense. For the lattice sandwich plates, the vibration modal analysis and SHPB experiment was carried out, which revealed some new phenomenon and physical mechanisms. Lattice composites materials have higher peak stresses and the main failure mode is brittle fracture of struts. Metal lattice materials have better ductility and energy absorption due to plastic buckling of struts. From static tests to dynamic tests, the structures responses to strain rate made big differences to the experimental results. The most important is that the mean peak force increase about 20% from static to dynamic.

Keywords: Lattice materials, Sandwich structures, Vibration modal analysis, SHPB