

In this research, we investigate the nonlinear vibration of functionally graded carbon nanotubes (FG-CNTs) for simply supported sandwich cylindrical panels. The sandwich consisting of three layers formed of (FG-CNTs) and isotropic material as (CNT, ALMINUME, CNT). Mechanical properties of the sandwich media are acquired according to a refined rule of blend approach. The governing equations were derived using a first-order deformation theory (FOSDT). Four kinds of carbon nanotubes of sandwich cylindrical panels were analyzed. The volume fraction of CNTs is varied. The properties of nonlinear responses and free vibration are studied. The numerical approach employs the fourth-order Runge-Kutta and Galerkin procedure. Which conducted for the dynamic analysis of the panels to present the natural frequencies and non-linear dynamic response expression. The results show that; the natural frequencies and the nonlinear vibration amplitude decrease with the volume fraction and thickness ratio increase. The nonlinear vibration amplitude response increases when increasing the excitation force. The initial imperfection and the elastic foundation have a minor impact on the nonlinear vibration response of the panel. The Pasternak Foundation has a larger impact than the Winkler foundation. The structure formed of FG-CNT present an excellent choice for high-performance of engineering applications.