Buckling analysis of laminated composite simply supported cylindrical shell under cryogenic environment is solved by using exact approach. The theoretical formulation is based upon the third-order shear deformation theory, then equation of motion are derived and solved using Fourier series to obtain critical buckling load by solving eigenvalue problem for different cryogenic gradients. Many design parameters are changed such as using different material, number of laminate, aspect ratio (L/R) and thickness ratio (R/h). Results show that changing cryogenic temperature improve buckling load for all material of cylindrical shell, the results show good agreement with those published by other researchers.

References

Buckling Analysis of Composite Cylindrical Shell under Cryogenic Environments

- L. Scattieia, G. Tomassetti, M. Kivel Mazuy, S. Cantoni, Prora USV- Tech cryotank project Applicability of CFRP to tank manufacturing for cryogenic liquid propulsion; 54th International astronomical congress of international astronomical federation, the international academy of astronautics, and the international institute of space law, 29 September-3 October 2003, Bremen, Germany.
- Lanhe Wu, Zhiqing Jiang, Jun Liu, Thermoeelastic stability of functionally graded cylindrical shells; Composite Structures, Vol. 70, Issue 1, August 2005, pp. 60–68.
- Shruti Deshpande, M. S.; Buckling And Post Buckling Of Structural Composites; M. Sc. thesis, the University of Texas at Arlington, 2010.

Index Terms

Computer Science

Applied Mathematics
Keywords

Buckling  Composite material  Cryogenic  Shell  Cylindrical  Shell theory.