

عنوان مقاله:

The Dynamic and Vibration Response of Composite Cylindrical Shell Under Thermal Shock and Mild Heat Field

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خلاصه مقاله:

In this article, the vibration and dynamic response of an orthotropic composite cylindrical shell under thermal shock loading and thermal field have been investigated. The problem is that the shell is initially located at a first temperature, and some tension caused by a mild heat field is created, then the surface temperature of the cylinder suddenly increases. The partial derivative equations of motion are in the form of couplings with the heat equations. First, the equations of motion are derived by the Hamilton principle, here first-order shear theory and considering strain-shift relations of Sanders are used. Then, the equation system including the equations of motion and energy equations by the Runge–Kutta fourth-order method are solved. In this study, the effects of length, temperature, thickness and radius parameters on natural frequencies and intermediate layer displacement are investigated. The results show that the increase in external temperature decreases the natural frequency and increases the displacement of the system. Also, the results of radial transitions were evaluated with previous studies and it was found that it is in good agreement with the results of previous papers.

کلمات کلیدی:

Thermal Shock, Composite, Thermal field, Vibration

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