

## Study and Solving Partial Differential Equation of Danel Equation in the Vibration Shells

**Authors :** Hesamoddin Abdollahpour, Roghayeh Abdollahpour, Elham Rahgozar

**Abstract :** This paper we deal with an analysis of the free vibrations of the governing partial differential equation that it is Danel equation in the shells. The problem considered represents the governing equation of the nonlinear, large amplitude free vibrations of the hinged shell. A new implementation of the new method is presented to obtain natural frequency and corresponding displacement on the shell. Our purpose is to enhance the ability to solve the mentioned complicated partial differential equation (PDE) with a simple and innovative approach. The results reveal that this new method to solve Danel equation is very effective and simple, and can be applied to other nonlinear partial differential equations. It is necessary to mention that there are some valuable advantages in this way of solving nonlinear differential equations and also most of the sets of partial differential equations can be answered in this manner which in the other methods they have not had acceptable solutions up to now. We can solve equation(s), and consequently, there is no need to utilize similarity solutions which make the solution procedure a time-consuming task.

**Keywords :** large amplitude, free vibrations, analytical solution, Danell Equation, diagram of phase plane

**Conference Title :** ICAMAME 2017 : International Conference on Aerospace, Mechanical, Automotive and Materials Engineering

**Conference Location :** Rome, Italy

**Conference Dates :** March 05-06, 2017