

Vibration Analysis of Pendulum in a Viscous Fluid by Analytical Methods

Authors : Arash Jafari, Mehdi Taghaddosi, Azin Parvin

Abstract : In this study, a vibrational differential equation governing on swinging single-degree-of-freedom pendulum in a viscous fluid has been investigated. The damping process is characterized according to two different regimes: at first, damping in stationary viscous fluid, in the second, damping in flowing viscous fluid with constant velocity. Our purpose is to enhance the ability of solving the mentioned nonlinear differential equation with a simple and innovative approach. Comparisons are made between new method and Numerical Method (rkf45). The results show that this method is very effective and simple and can be applied for other nonlinear problems.

Keywords : oscillating systems, angular frequency and damping ratio, pendulum at fluid, locus of maximum

Conference Title : ICAMAME 2016 : International Conference on Aerospace, Mechanical, Automotive and Materials Engineering

Conference Location : Venice, Italy

Conference Dates : November 07-08, 2016