

Dynamic Response of Euler- Bernoulli Beam on Variable Pre-stressed under a Partially Distributed Moving Load

Authors : Idowu Ibikunle Albert

Abstract : In this 21st century, all areas of transport have experienced large advances characterized by increasing in higher speeds and weight of vehicles. As a result, the structures and weight of vehicles move have been subjected to different vibrations and dynamics. In this paper dynamics response of the Euler-Bernoulli beam on variable pre-stressed under a partially distributed moving load was investigated. The governed equation of the fourth-order partially differential equation (PDE), which was reduced to the second-order ordinary differential equation (ODE), using an analytical method in term of series solution which was solved numerically using mathematics software (MAPLE 16). The Results show the response amplitude of both moving masses and moving force for variable pre-stressed increase as the mass of the load increases, and the deflection of the beam decrease as the values of pre-stressed (N) increases for both moving mass and moving force. The comparison of moving mass and moving force shows that moving mass is larger than that of moving force.

Keywords : dynamic response, Euler-Bernoulli beam, moving load, partially distributed, variable pre-stressed foundation

Conference Title : ICMPSSE 2022 : International Conference on Mathematical, Physical Sciences and Engineering

Conference Location : Amsterdam, Netherlands

Conference Dates : May 16-17, 2022