World Academy of Science, Engineering and Technology
International Journal of Mechanical and Materials Engineering
Vol:10, No:01, 2016

Free Vibration Analysis of Composite Beam with Non-Uniform Section Using Analytical, Numerical and Experimental Method

Authors : Kadda Boumediene, Mohamed Ziani

Abstract : Mainly because of their good ratio stiffness/mass, and in addition to adjustable mechanical properties, composite materials are more and more often used as an alternative to traditional materials in several domains. Before using these materials in practical application, a detailed and precise characterization of their mechanical properties is necessary. In the present work, we will find a dynamic analyze of composite beam (natural frequencies and mode shape), an experimental vibration technique, which presents a powerful tool for the estimation of mechanical characteristics, is used to characterize a dissimilar beam of a Mortar/ natural mineral fiber. The study is completed by an analytic (Rayleigh & Rayleigh-Ritz), experimental and numerical application for non-uniform composite beam of a Mortar/ natural mineral fiber. The study is supported by a comparison between numerical and analytic results as well as a comparison between experimental and numerical results.

Keywords : composite beam, mortar/ natural mineral fiber, mechanical characteristics, natural frequencies, mode shape
Conference Title : ICMME 2016 : International Conference on Mechanical and Materials Engineering
Conference Location : Jeddah, Saudi Arabia
Conference Dates : January 26-27, 2016