Thermal Buckling of Functionally Graded Panel Based on Mori-Tanaka Scheme

Authors : Seok-In Bae, Young-Hoon Lee, Ji-Hwan Kim

Abstract : Due to the asymmetry of the material properties of the Functionally Graded Materials(FGMs) in the thickness direction, neutral surface of the model is not the same as the mid-plane of the symmetric structure. In order to investigate the thermal bucking behavior of FGMs, neutral surface is chosen as a reference plane. In the model, material properties are assumed to be temperature dependent, and varied continuously in the thickness direction of the plate. Further, the effective material properties such as Young's modulus and Poisson's ratio are homogenized using Mori-Tanaka scheme which considers the interaction among adjacent inclusions. In this work, the finite element methods are used, and the first-order shear deformation theory of plate are accounted. The thermal loads are assumed to be uniform, linear and non-linear distribution through the thickness directions, respectively. Also, the effects of various parameters for thermal buckling behavior of FGM panel are discussed in detail.

Keywords : functionally graded plate, thermal buckling analysis, neutral surface **Conference Title :** ICNST 2015 : International Conference on Nano Science and Technology

Conference Location : Kuala Lumpur, Malaysia Conference Dates : February 12-13, 2015