

## عنوان مقاله:

Reliability analysis of nanocomposite beams-reinforced by CNTs under buckling forces using the conjugate HL-RF

## محل انتشار:

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## خلاصه مقاله:

In this paper, the nonlinear conjugate map based on the conjugate Hasofer-Lind and Rackwitz- Fiessler (CHL-RF) method is applied to evaluate the reliability index using first order reliability method of the embedded nanocomposite beam, which is made from polymer reinforced with carbon nanotubs (CNTs). The structure is simulated with Timoshenko beam model. The Mori-Tanaka model is applied for calculating the effective material properties of nanocomposite beam. The surrounding elastic medium is considered by spring and shear constants. Based on energy method and Hamilton's principle, the governing equations are derived. Using an analytical method, the buckling performance function of structure is obtained. The effects of the basic random variables including the length to thickness ratio of beam ( $L/h$ ), spring constant and shear constant of foundation with respect to the volume fraction of CNTs are investigated on the reliability index of the nanocomposite beam subjected to axial force of 20 GPa. The results indicated that the failure probabilities of the studied nanocomposite beam are sensitive to the length to thickness of beam ( $L/h$ ) and spring constant of foundation variables.

## کلمات کلیدی:

Nanocomposite beam; Conjugate HL-RF; first order reliability method; Timoshenko beam model

## لینک ثابت مقاله در پایگاه سیویلیکا:

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