

## عنوان مقاله:

Comparative study on the lateral stability strength of laminated composite and fiber-metal laminated I-shaped cross-section beams

## محل انتشار:

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## خلاصه مقاله:

The current investigation aims to peruse the discrepancies between the endurable transverse buckling load of multi-layer fibrous composite and fiber-metal laminate (FML) I-section beams. Using the energy method, the governing differential equations are extracted in accordance with the classical laminated plate theory and Vlasov's model for non-uniform torsion. Then, the equilibrium equations system is numerically solved via the differential quadrature method as a powerful and accurate technique, and finally, the lateral buckling load is calculated. Numerical results are presented for a simply supported I-beam under gradient moment. The accuracy of the proposed method is examined by comparing the results with those obtained by ANSYS finite element software. By considering the best conventional stacking sequences, the lateral stability strength of FML and laminated composite beams with I-shaped cross-sections are compared to each other for different fiber composite materials, end moment ratios, mode numbers, and metal volume fractions of the web and both flanges. The results show that the transverse buckling load of the selected I-beam is significantly affected by the mentioned parameters. In addition, the numerical outcomes indicate that the lateral buckling capacity of CARALL is more than GLARE for all analyzed cases.

## کلمات کلیدی:

Lateral stability, Fiber metal laminates, Thin-wall beam, Conventional lay-ups, Differential quadrature method

## لینک ثابت مقاله در پایگاه سیویلیکا:

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