

## عنوان مقاله:

Buckling Analysis of a Beam with Non-uniform Thickness

## محل انتشار:

اولین کنفرانس بین المللی مکانیک مواد و تجهیزات پیشرفته (سال: 1396)

تعداد صفحات اصل مقاله: 5

## نویسنده:

Masoud Noroozi - Assistant Professor, Faculty of Mechatronic, Karaj Islamic Azad University Karaj, Iran

## خلاصه مقاله:

Buckling phenomenon has been considered by many researchers for various systems under different conditions of loading, geometry and material behavior. This work investigates the buckling behavior of an Euler-Bernoulli beam with a quadratic thickness pattern. The solutions are derived in terms of Mathieu functions analytically by solving the eigenvalue problem of the system, and the buckling loads and mode shapes are studied. The effects of the non-uniform thickness on the buckling parameters are investigated. Using a regression analysis, it is shown that the critical buckling load linearly increases versus the non-uniform thickness parameter for the quadratic thickness pattern as the thickness of the system increases. The results show the importance of the thickness variation in design and controlling instability of thin structures in the practical applications in MEMS or NEMS.

## کلمات کلیدی:

Buckling, Instability, Beam theory, Analytical solution, Mathieu function

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/800244>

