

## عنوان مقاله:

Non-Conservative Stability Analysis of a Tilt-wing Beam Structure Subjected to Axial Follower Force

## محل انتشار:

سی و یکمین همایش سالانه بین المللی مهندسی مکانیک ایران و نهمین همایش صنعت نیروگاهی ایران (سال: 1402)

تعداد صفحات اصل مقاله: 5

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## خلاصه مقاله:

In this paper, the stability problem of a tilt-wing beam structure subjected to an axial follower force is investigated. The tilt-wing is modeled as two interconnected beams. Since, the length of the fix and tilt beams can be changed in the model, so the conventional configurations of tilt-rotor and tilt-wing can be derived from the present model. Using Hamilton's principle, the governing equations of motion of the beam as well as the boundary conditions are derived on the basis of Euler-Bernoulli beam theory. The compatibility conditions are also derived using geometrical relations. Generalized differential quadrature (GDQ) method is also used to discretize the equations. Effects of the tilt angle and the tilt wing length on the beam stability has been studied. Results showed that by decreasing the length of the tilt-wing, the instability load increases, which implies that the structure is more stable. This research results can help the understanding of the wing structural stability in modern vertical take-off and landing (VTOL) aircrafts, like tilt-rotors and tilt-wing by combining the two concepts.

## کلمات کلیدی:

Tilt-wing, Tilt-rotor, Axial follower force, Non-conservative stability, Differential quadrature method

## لینک ثابت مقاله در پایگاه سیویلیکا:

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