

## عنوان مقاله:

Increasing the Fundamental Frequency of the Cantilever Rotating Beam by Placing the Intermediate Elastic Support with Minimum Stiffness at the Optimum Point Based on the Courant's Maximum–Minimum Theorem using Finite-Element Analysis Software

## محل انتشار:

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## نویسندگان:

Mehdi Asgarikia - *Department of Mechanical Engineering, Takestan Branch, Islamic Azad University, Takestan, Iran*

Farshad Kakavand - *Department of Mechanical Engineering, Takestan Branch, Islamic Azad University, Takestan, Iran*

Hasan Seidi - *Department of Mechanical Engineering, Takestan Branch, Islamic Azad University, Takestan, Iran*

## خلاصه مقاله:

In this paper, the effect of the optimal position and minimum stiffness of the elastic middle support on increasing the fundamental frequency of a rotating cantilever beam is investigated based on the Courant's maximum–minimum theorem using ABAQUS finite element software. First, the software analysis results are compared with the numerical analysis results for a non-rotating cantilever beam to confirm the accuracy of the software model. Next, by placing the middle elastic support at the optimal point selected based on the Courant theorem, the minimum stiffness of the elastic intermediate support for the maximum fundamental frequency of the rotating console beam was obtained. The results of this study prove that the Courant's maximum–minimum theorem is completely valid for rotating cantilever beams and can be used to improve the vibrational behavior of rotating engineering components. Finally, the minimum diameter of damping wire for the turbomachine blade is calculated as a practical application of the minimum stiffness of the intermediate elastic support for the rotating beam.

## کلمات کلیدی:

Blade, Damping Wire, Fundamental Frequency, Intermediate Elastic Support, Rotating Beam, Stiffness

## لینک ثابت مقاله در پایگاه سیویلیکا:

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