
DESIGN PARAMETERS OF OSCILLATION ELIMINATOR

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ABSTRACT

The paper addresses the mathematical modelling of advanced vibration systems. It focuses on the analysis and modification of existing mathematical models, and discusses the development of new ones. These models will be intended to meet the experimental requirements of developing progressive dynamic dampers for mechanical systems. The primary objective is to identify the key design parameters governing the damping and overall system's response. The theoretically determined identifiers will be then verified and assessed within the experiments. The design of innovative progressive dampers typically relies on a combination of dynamic modelling and experimental validation.

Effective damping can significantly extend machine life, reduce the negative impacts of vibration on operation, improve human comfort, increase energy efficiency, and lower environmental impact.

Practically, the detected parameters will be applied in the construction of inventive vibration systems and their control. On the other hand, we plan to adapt the mathematical model also for academic use and include it directly into education of future engineering specialists. Moreover, this can serve as excellent material for active and interactive learning methodologies. These approaches effectively foster teamwork, a soft skill highly sought after by employers due to a currently widely recognized shortage of collaborative and communication abilities. Ultimately, it strengthens students' comprehensive engineering competencies. We also expect that the integration of theory, experiment, and practical application will boost students' engagement with the mathematical fundamentals of engineering as well.

Keywords Mechanical vibration system · Mathematical model · Advanced damper

References

- [1] Brepta R., Pust L., Turek F., *Mechanické kmitání*, (in Czech). Praha: Sobotáles, 1994.
- [2] Meirovitch, L., *Methods of Analytical Dynamics*, McGraw-Hill, 1970.