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Assessment of the PhD Thesis on  
**'Mitigation of Vibrations of Structures Using a Tuned Mass Damper with Inerter and  
Nonlinear Dashpot'** by **Mateusz Lazarek**

The thesis presents comprehensive investigations of mechanical vibration suppression by using an inerter and nonlinear damping. The studies are undertaken by both numerical and experimental means demonstrating that the student has mastered powerful research tools. The experiments were carried out on the unique rig developed by the Division of Dynamics at the Lodz University of Technology. The modelling and analysis are of high standard and the obtained results are highly publishable (in my view, in addition to the JSV article, a couple of journal papers can be written from this work). The PhD project was supervised by Professor Przemyslaw Perlikowski and Dr Piotr Brzeski from the Division of Dynamics led by Professor Tomasz Kapitaniak. The investigated topic is novel, timely, challenging and practically important.

The thesis starts with a brief introduction on vibration suppression focussed on the dynamic vibration absorption using tuned mass dampers, which is used to set up the main objective and motivate the undertaken work. This is followed by six technical chapters examining mathematically and experimentally dynamics of various vibration suppression models with the aim to optimise their system parameters. The depth of the analysis and discussions demonstrates clearly the new research findings and there an exceptional agreement between the numerical predictions and experimental verification. This is followed by significant and well-argued conclusions, bibliography and a short description of the abstract, thesis and main objective in Polish.

The thesis is very well structured and written. The command of English is good and the presentation is commendable. There are few minor typos and it would be useful to add a list of symbols.

In conclusion, the thesis has clearly made a distinct contribution to knowledge in the field of mechanics. It affords ample evidence of originality and the exercise of independent critical powers. At this stage, I have no reservations about the award of the PhD to this student.

Marian Wiercigroch