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An Algorithm for 3D Vibration Measurement Using One Laser Scanning Vibrometer

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3D vibration measurement is achieved using one laser scanning vibrometer(LSV) and Light Detection And Ranging(LIDAR) by moving the LSV to three arbitrary locations from the principle that vibration analysis based on the frequency domain is independent of the vibration signal based on time domain. The proposed algorithm has the same effect as using three sets of LSVs. It has an advantage of reducing the costs. Analytical approach of obtaining in-plane and out-of-plane vibration of surface is introduced using geometrical relations between three LSV coordinates and vibration measured at three different locations.

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Ключевые слова:

Содержание

Abstract
Introduction
Prinsiple of proposed 3D vibration measurement
The transformation matrix between the coordinate systems
In-plane and out-of-plane vibration
Conclusion
Acknowledgements