

Press Release

Date: June 2021
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Reference number: PR-0015-CPE-230321-DRON

Laser measurement technology for quiet drones

Vibrations generate disturbing noise and disrupt the function of technical systems. Both challenges exist in the development of drones, which on the one hand should be quiet and on the other hand might carry sensitive sensor technology safely. Both challenges can be solved using powerful optical measurement technology.

The precise determination of vibrational characteristics of the drone's body and propellers is a necessary step in the development of silent drones. 3D scanning laser Doppler vibrometers have the potential to display the surface vibration of a structure in detail in all three directions – without contact and across the entire necessary frequency spectrum. Such measurements can be used directly to find the zones of high vibration by experimental modal analysis. This is important e.g. for finding a suitable position for an on-board camera.

More importantly, the visualized vibrational behaviour can also be used to validate and improve finite element (FE) simulations of the vibration characteristics. If the FE model is first adapted and then validated, specific design improvements for quieter flying can be introduced via this model.

Measurement of the vibration characteristics of the propellers during operation is a particular challenge. Optical vibration measurement using a so-called optical derotator, which compensates the rotation of a measurement object in order to conduct measurements on a quasi-stationary sample, can provide further insights.

For more information regarding the potential of Polytec laser vibrometry, visit <https://www.polytec.com/int/vibrometry/products/full-field-vibrometers>

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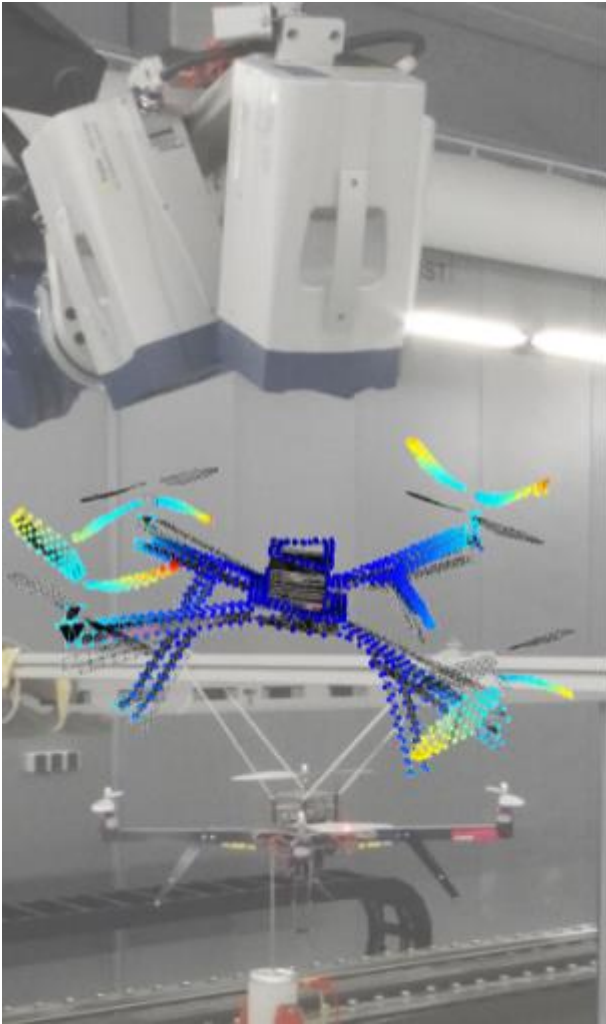
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