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Non-contact Condition Monitoring of Wind Turbines Using Laser Vibrometers

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Non-contact Condition Monitoring of Wind Turbines Using Laser Vibrometers

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Sponsors



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Concept and Objectives

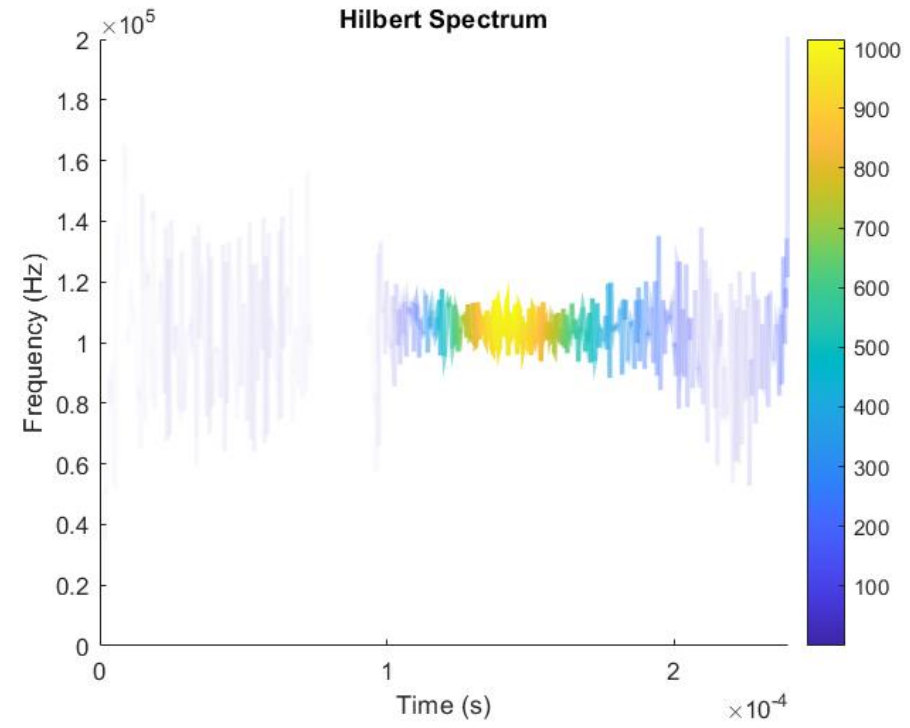
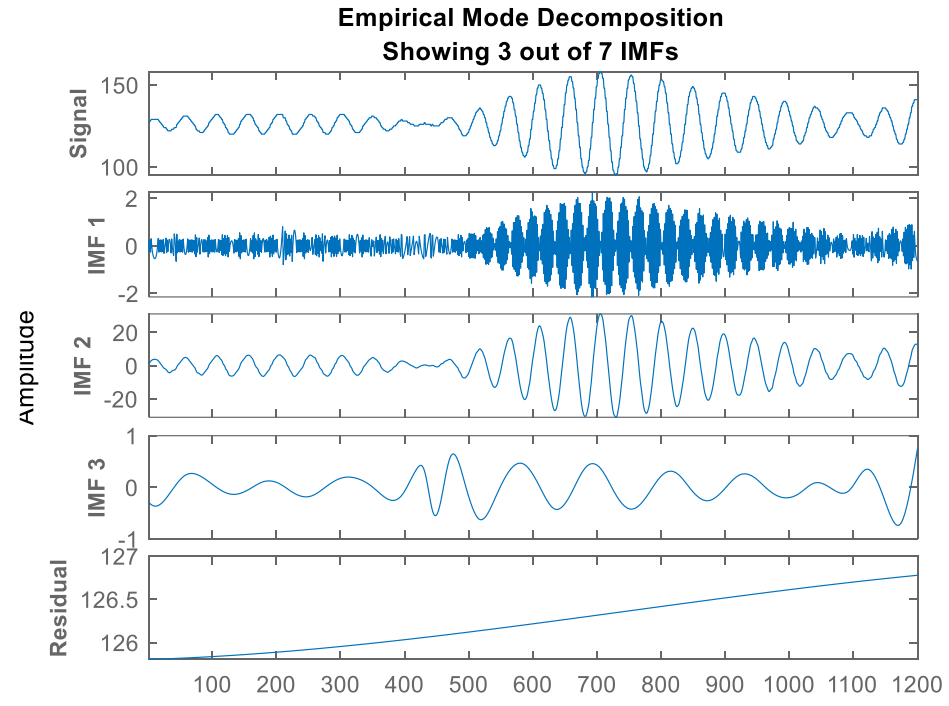
- Use vibration-based data to monitor the condition of wind turbines and detect damage and cracks in the structure.
- Remote sensing techniques (e.g., using laser vibrometers), as a non-contact approach, offer great flexibilities for wind turbine monitoring.



Wind turbine monitoring using LDV as a non-contact approach (Fraunhofer Institute of Optronics).

Hilbert-Huang Transformation (HHT) of vibration data

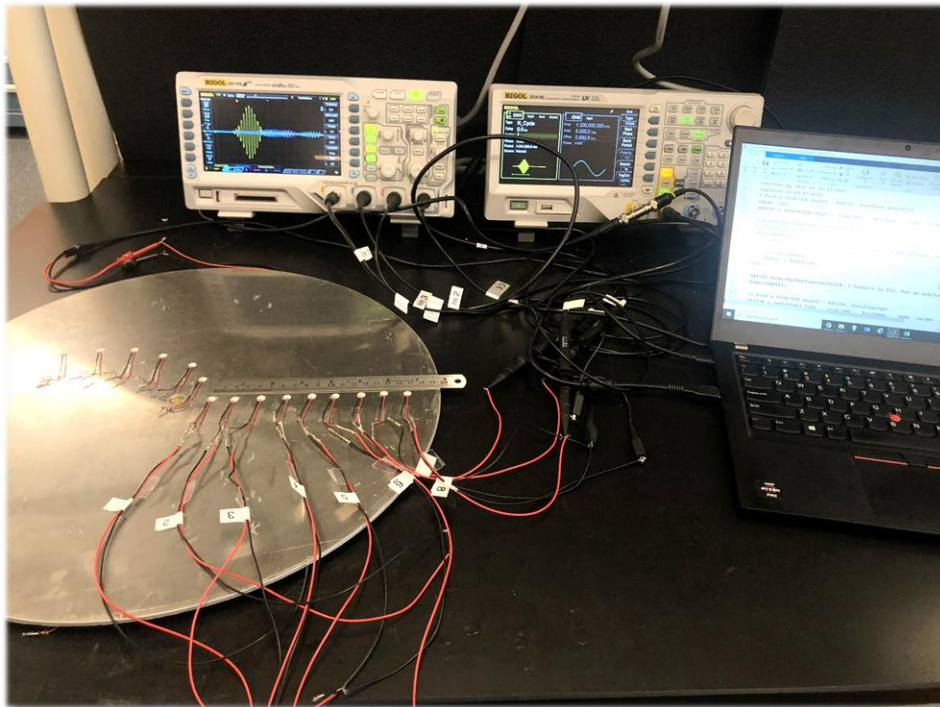
- The Hilbert-Huang transformation provides information in both frequency and time domain and is capable of detecting non-linear response.



HHT of a sample vibration data

New Laser Doppler Vibrometer Component

- We have built a testing platform to study vibrational characteristics under a lab set-up.
- A new LDV unit (\$82k) is being acquired to perform the task in a more realistic setup.



Lab-based measurement



LDV with remote sensing capabilities