# MAUL·THEET
Vibration Test & Analysis

Modal Analysis of Rotors in Operation

vRotorModal

The **vRotorModal** is a system for determining the modal values of rotating components during operation. In the case of brake discs, for example, the change in natural frequencies and damping are determined as a function of the brake pressure.


Test setup with data transfer by slip rings
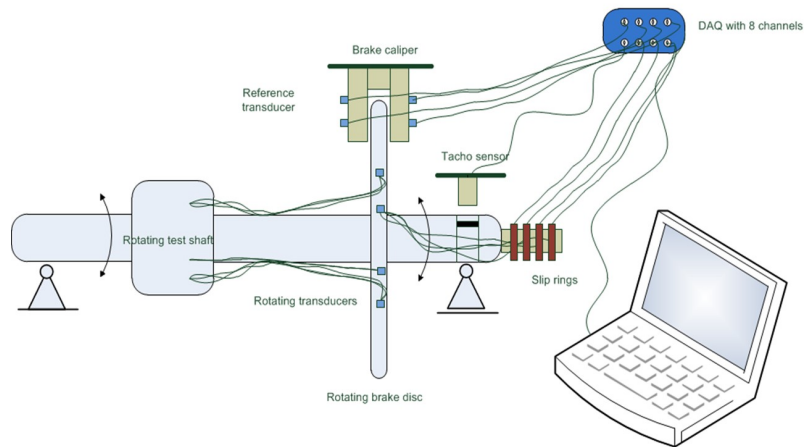
- **vAnalyzer**
- **4-32 Channels**
- **24 Bit, 100 kHz,**
- **AC, DC, IEPE**
- **Sensor Database**
- **Time Recording**
- **vSpeedBox**
- **Tacho-Signal**
- **vRotorModal**
- **Time data Derotator**
- **Geometry Generator**
- **OMA Module**
- **ODS Module**
- **Short Measurements for various Operating Points**

vRotorModal System includes the following components:
- Accelerometers
- Slip ring transmitter
- Speed sensor
- Data acquisition
- Recorder software
- Analysis software
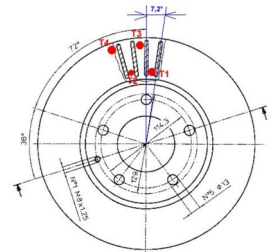
Signals
The signals from the acceleration sensors fixed into the brake disc are transmitted to the measurement data acquisition via the slip rings.

Recorder
With the **vAnalyzer** recorder, all vibration signals and the tachometer signal are sampled and stored synchronously.

The further processing of the time data for the operating modal or operating deflection shape analysis takes place offline with the **vRotorModal** software.

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vRotorModal

The main module of the rotating OMA is the **_vRotorModal_** software. It includes the following components:

- Generation of the wireframe model
- Derotation of the sensor signals
- Angle-dependent assignment of the time blocks
- OMA calculation
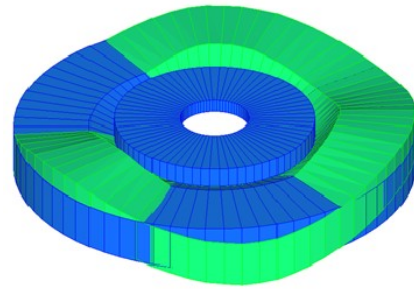- ODS calculation
- Animation of the deflection shapes
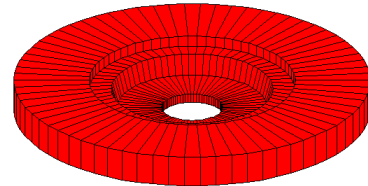
Results ODS
- Frequency
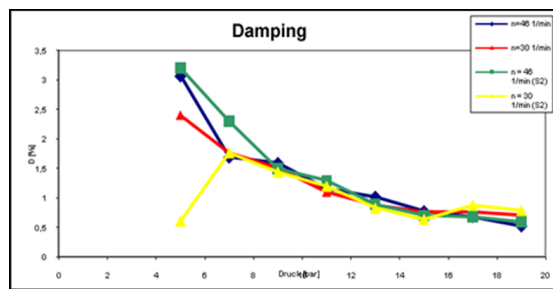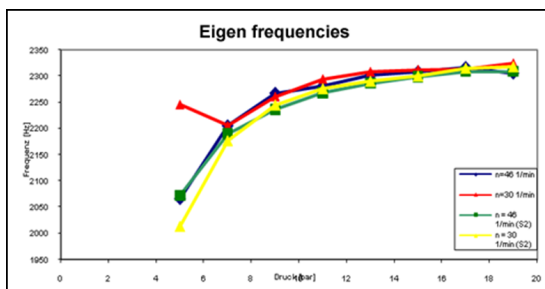- Operating Deflection Shape

Results OMA
- Natural frequencies
- Damping
- Mode Shapes

The short measurement times allow to do a high amount of tests for various operating parameters within an acceptable time.

Example: Brake Rotor

- Measurement time per operating point about 30s
- 4 rotating Triax sensors
- 840 Degrees of freedom

The measurements were carried out at 2 speeds and 8 brake pressures.

The diagrams show the change of frequency and damping depending on the brake pressure for one natural frequency.

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