



# Laser Scanning Vibrometer

Measured quantities	Displacement, velocity, acceleration
Measured objects	Arbitrary surfaces and vibrating objects
Specifications	Bandwidth: 80 kHz Max. velocity: 10 m/s Resolution: 0,02 $\mu\text{m/s}$ Channels: 4 Scan field: $\pm 20^\circ$ Number of scan points: 512 x 512 Frequency resolution: 6400 frequency lines
Equipment	Polytec PSV 400 Laser Scanning Vibrometer OFV-5000 Controller VD-09 Digital Velocity Decoder VD-08 Digital Velocity Demodulator Signal processor Time data analysis Script programming and open data interfaces

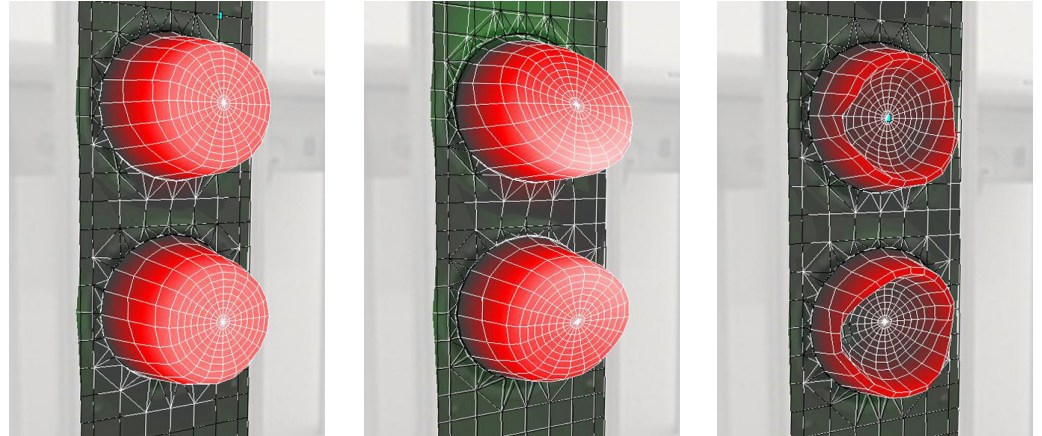
## Measurement examples

Scan of a **two-way floor-standing speaker** with two low to mid and one high range drivers. Depicted is the instantaneous amplitude of the displacement of one of the low to mid range drivers at different frequencies.

left: Piston-like diaphragm movement, optimal airborne sound stimulation at 31 Hz.

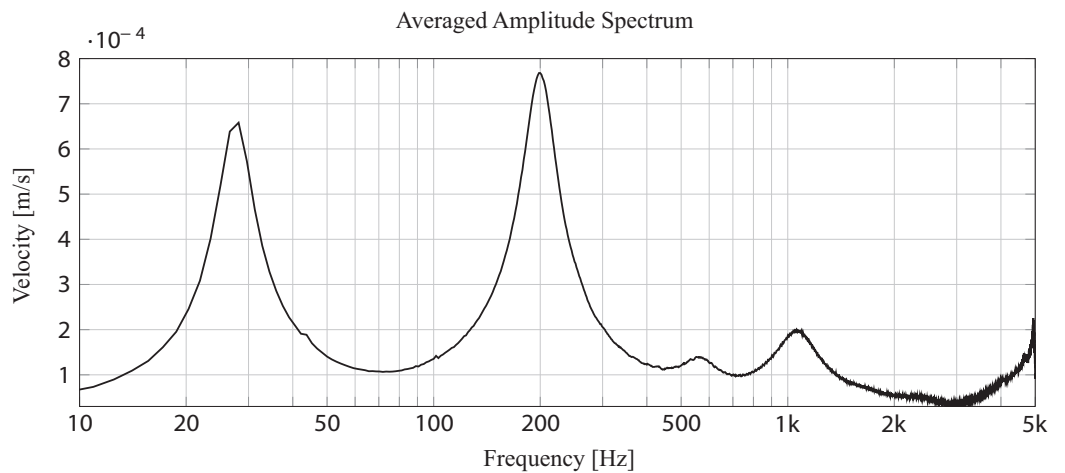
middle: 272 Hz, rocking mode, tilting of the diaphragm.

right: 1084 Hz, radial mode, opposite phase of the displacement of the diaphragm center and surrounding.

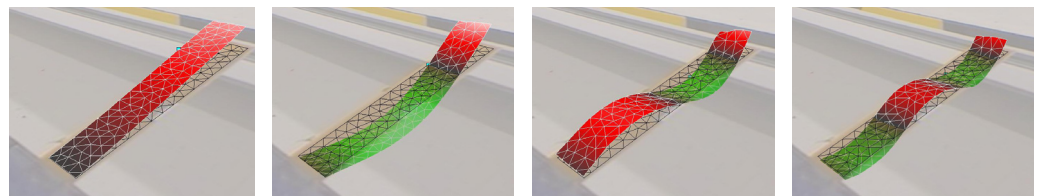


Operating deflection shapes of a **piezoelectric actor element (MFC)** fixed at one end. The diagram shows the average velocity of all scan points over the frequency. Below the first four modes are shown as the instantaneous amplitude of the displacement.

Amplitude spectrum of the velocity averaged for all scan points.



Operating deflection shapes corresponding to the local maxima of the spectrum at 28 Hz, 198 Hz, 530 Hz and 1077 Hz (from left to right).



Distribution of velocity (RMS) for two **distributed mode loudspeakers** with an exciter mounted at the center of the vibrating plates and a sinusoidal excitation with a frequency of 5 kHz.

left: Simple Plexiglas plate: Reflections at the edge result in vibrations of the entire structure.

right: Epoxy resin plate with special edge geometry: Reflections at the edge are effectively prevented.

