

Influence of the calibration process of the impedance tube measurement on the acoustic parameters

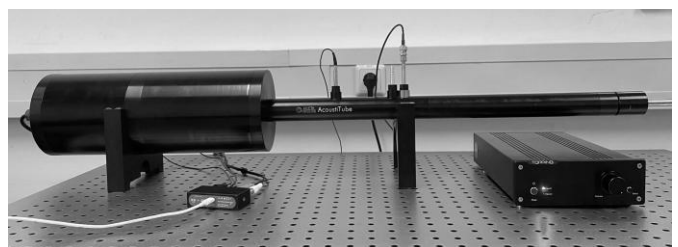
Study project or master's thesis

The standardised determination of the sound absorption coefficient and the surface impedance of materials under plane wave incidence is based on impedance tube measurements according to ISO 10534-2, the 2-microphone method. This method is based on the excitation of plane waves in a tube, the measurement of the sound pressure at two fixed points, whereby the interference field is decomposed, and the measurement of the ambient conditions. The acoustic properties are determined based on the transfer behaviour between the two microphones. Due to the phase and pressure amplitude errors of the microphones, the transfer function must be corrected by a frequency-dependent correction factor. It has been shown that errors during correction affect all subsequent measurements and therefore reproducibility cannot be guaranteed

In this work, (1) the influence of the calibration process on the acoustic properties will be systematically analysed and (2) another method based on a least squares estimator will be implemented that does not require such a correction.

Requirements:

- Interest in experimental work
- Signal processing
- Good programming skills in Python
- Knowledge of acoustics is not essential, but helpful



Kontakt

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