Bachelor Thesis/TI-Project

Postprocessing Tool for Impedance Tube Measurements

Motivation

Impedance tubes are a common tool for measuring the acoustic properties of porous materials, such as acoustic foams. The standardized procedure (ISO 10534-2, ASTM 2611-19) utilizes two or four microphones based on the desired output quantities, which are one- or two-port acoustic parameters, respectively. The measurement results are stored in a database for each measurement. The goal of this project is to create a data postprocessing framework capable of systematic measurement data storage and protocol generation.

Goals

- Automated collection and storage of measurement data (thermometer, hygrometer, barometer, and impedance tube measurement results)
- Protocol generation according to the standards (ISO 10534-2, ASTM 2611-19)
- Software framework capable of handling result files of two- and four-microphone measurements

Tasks

- Literature research on impedance tube measurements (entry to the literature will be provided)
- Measure a specimen with the two- and four microphone methods to generate measurement results
- Create a Python script that reads the measurement result and stores the data systematically
- Automate the generation of measurement protocols using LaTeX according to the relevant standards (ISO 10534-2, ASTM 2611-19)

Organisation

- Language: English or German
- Start: immediately possible
- Required courses: Akustische Messtechnik VO
- Other requirements: Python, LaTeX, interest in acoustic measurement methods

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Figure 1: Brüel & Kjaer Type 4206 impedance tube.

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