

## Estimation of surface impedance using different types of microphone arrays - DTU Orbit (09/11/2017)

### Estimation of surface impedance using different types of microphone arrays

This study investigates microphone array methods to measure the angle dependent surface impedance of acoustic materials. The methods are based on the reconstruction of the sound field on the surface of the material, using a wave expansion formulation. The reconstruction of both the pressure and the particle velocity leads to an estimation of the surface impedance for a given angle of incidence. A porous type absorber sample is tested experimentally in anechoic conditions for different array geometries, sample sizes, incidence angles, and distances between the array and sample. In particular, the performances of a rigid spherical array and a double layer planar array are examined. The use of sparse array processing methods and conventional regularisation approaches are studied. In addition, the influence of the size of the sample on the surface impedance estimation is investigated using both experimental data and numerical simulations with a boundary element model. Results indicate that the small distance between the planar array and the sample favors a more robust estimation.

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