Microphone arrays for imaging of aerospace noise sources

Dr. Roberto Merino Martinez
Delft University of Technology (the Netherlands)

How can we see sound?

ACOUSTIC IMAGING

Based on the phase delays between microphones

Source map

 Loud

 Quiet

ACOUSTIC IMAGING

APPLICATIONS

Aircraft flyovers

Noise emissions are one of the current main limitations for aircraft operations.

Many commercial aircraft types emit a very strong tonal noise, which is particularly annoying.

The source of this tonal noise is the nose landing gear, which has open cavities that interact with the flow like a whistle.

Closing these open cavities would considerably reduce the noise levels around airports.

Assessing aircraft noise variability

Aircraft noise prediction models fail to account for the variability in the emitted noise levels.

Current models provide a single noise level value, but variations of about 10 dB (perceived as twice as loud) are measured for the same aircraft type.

Noise reduction measures

Noise reduction measures inspired in the silent owl flight, such as trailing edge serrations can help reducing airfoil noise (6 dB less) by alleviating the acoustic impedance discontinuity at the trailing edge.

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Email: robertomerinomartinez@gmail.com