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Investigation of Holographic Reconstruction Algorithms in Nearfield Acoustic Holography

*ABSTRACT - Masterthesis*

Acoustical-based imaging techniques have found merit in determining the behavior of vibrating structures. These techniques are commonly used in numerous applications to obtain detailed noise source information and energy distributions on source surfaces. The Near-field Acoustical Holography has been recognised as a very useful mean to predict the true appearance of the source. The aim of this thesis is to apply Near-field Acoustic Holography (NAH) as a tool to locate the sound field of the source using a microphone array. The Fourier technique was used to reconstruct the sound source. With this NAH technique the three-dimensional acoustic field is reconstructed from a two-dimensional measurement. Sound pressure, particle velocity field, the intensity of a stationary sound source is calculated. A loudspeaker was experimentally used as a source and the rectangular microphone array with the column of 10 and 6 rows measured the sound field from the source. All the measurements obtained from the microphone array are simulated using the Matlab simulation tool and the results were investigated.