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A two-dimensional ANC system - from simulation to application

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An existing two-dimensional active noise control (ANC) system attenuates a given noise (primary field) inside a certain area and frequency range by an additionally generated sound (secondary field). The two-dimensional ANC system consists of several modules containing a pair of microphones and a line array of loudspeakers each. The configuration of the modules depends on the acoustical environment and the desired shape of the protection area. Planning this is supported by a tool based on simulating the superposition of both sound fields.
This spatial, close to reality simulation for predicting the achievable noise attenuation and determining important system parameters is implemented in MATLAB. With this planning tool it is possible to place all required acoustic sources and sinks into a virtual room and analyze the properties of the resulting sound field concerning real application scenarios.
This paper draws a comparison between the results given by simulation and the subsequently realized ANC system within the scope of a typical application.