

Active Sound Control with Preservation of Wanted Sound

The problem of noise reduction appears in many applications related to civil and aerospace engineering. The key element of the project is the development and implementation of a novel approach to active sound control based on surface potentials. In the active sound control, additional sound sources are introduced in such a way that the total acoustic field in the protected domain is equivalent to noise attenuation. Along with the unwanted noise coming from outside, a wanted sound is accepted in the domain to be shielded. The uniqueness of the new approach is that it does not require any information about the noise sources apart from the total acoustic field on the boundary of the domain to be shielded. In addition, it allows the wanted sound inside the protected area to be generated. This component is preserved whilst noise component being attenuated. The real-life implementation requires the study of such vital aspects as optimisation of the secondary sources, sensitivity analysis and taking into account the diffraction effect of the secondary sources. The project includes computational and theoretical elaboration of these tasks. Potential applications in aeroacoustics, oil prospecting and civil engineering can be considered.

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