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NOISE CONTROL FOR A BETTER ENVIRONMENT

Noise Predictions with Sound Systems
using System Data & Complex Summation (Implemented in SoundPLAN & NoizCalc)

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Abstract

As the number of out-door events in urban areas is increasing, so are the challenges with accompanied noise immissions and therefore the need for accurate noise predictions. A method for noise predictions with sound systems is introduced, that uses real system data and applies complex summation.

The system data, including all acoustic relevant characteristics such as relative positioning, orientation and directivity of loudspeakers, delays and electronic filters, is imported with a system design file (d&b's ArrayCalc simulation software). This procedure eliminates any friction losses, because it spares the repeated process of re-modeling a sound system in the noise prediction software and ensures predictions with the actual system design. It also is a sensible way to include specific electronic filters such as IIR and FIR of a sound system.

Noise prediction software did not consider complex summation because noise sources are assumed not to be correlated with each other (e.g. in traffic and industry). Sound systems are different, because the signals sent to the loudspeakers are usually correlated. Further more, modern sound systems use coherence effects to influence directivity.

The sound propagation calculation was extended for complex summation and the method was implemented in SoundPLAN software and in NoizCalc (d&b).