Auralizations with loudspeaker arrays from a phased combination of the image source method and acoustical radiosity - DTU Orbit (16/06/2019)

In order to create a simulation tool that is well-suited for small rooms with low diffusion and highly absorbing ceilings, a new room acoustic simulation tool has been developed that combines a phased version of the image source with acoustical radiosity and that considers the angle dependence of the surface properties. The new tool is denoted PARISM, and here PARISM is used to create loudspeaker array-based auralizations. Different auralization techniques are compared, such as Ambisonics, vector-based panning, and the method of nearest loudspeaker. The implementations of the auralization techniques with PARISM are described and compared to implementations of auralizations with another geometrical acoustic simulation tool, i.e., ODEON and the LoRA toolbox that applies Ambisonics to ODEON simulations. In opposition to the LoRA toolbox, higher order Ambisonics are also applied to the late part of the PARISM impulse response, because more directional information is available with acoustical radiosity. Small rooms with absorbing surfaces are tested, because this is the room type that PARISM is particularly useful for.

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