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Perceptual Spatial Exploration of WFS Soundscapes

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Wave field synthesis (WFS) provides an accurate reproduction of a sound field over an extended listening area. Depending on the position of the virtual source, the wave front exhibits a given curvature and the listener can experience the continuous update of auditory localisation cues while wandering around the soundfield. Another possibility of WFS is to take into account the radiation properties of the simulated sound source in order to shape the sound field and its interactions with the reproduction room. These properties allow new listening conditions where the listener may navigate in the sound scene with consistent acoustical cues variations. This calls for new methods for spatial perception investigation where auditory perception must be integrated into a multisensorial frame. Especially, the congruence of auditory cues variations with idiothetic cues elicits the perception of the auditory spatial perspective. The study is illustrated with tests dedicated to the monitoring and perceptual assessment of sound scenes created in a WFS installation. In a first experiment, we study the necessity for maintaining independently the monitoring of the distance of sound objects through the conventional direct to reverberant ratio and through the WFS specific wave curvature control. In a second part, we study the influence of the interaction between the sound field generated by the WFS system and the reproduction room. This interaction is analysed with regard to the consistency between the resulting room effect and the actual acoustical properties of the reproduction room.

The complete document was not available at the publication time. It has been replaced by the submitted abstract.