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Subjective and objective evaluation of localisation accuracy in
wave field synthesis

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Wave Field Synthesis (WFS) is a holophonic technique that relies on the reproduction of physical properties of sound fields in an extended listening area. Limitations of this technique are due to approximations regarding the mathematical basis and have been studied in [Ber88] [dB04]. The synthesis remains correct up to a corner frequency referred to as the spatial aliasing frequency and inside an area limited by the length of the WFS array and the position of the virtual sources. A Multichannel Equalization filter (MEQ) is applied to the driving limentation signals of the loudspeakers, as described in [Cor06]. The aim of the present study is to evaluate localisation in WFS depending on both listening and source positions.

An objective analysis of the binaural signals is compared to the results of a localisation task for which spatialised high-pass filtered white noises served as stimuli. The results of the psycho-acoustic test are compared to the binaural localisation cues, namely ITD (interaural time differences) and ILD (interaural level differences). Above the aliasing frequency, ITD and ILD are conflicting and ILD errors account in most cases for the perceptual errors.