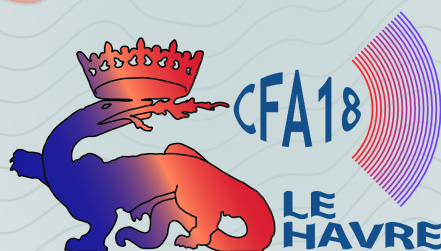


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## **Adaptive multizone sound field reproduction for moving listeners: Influence of listener's position and motion**

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The increasing number of audio reproduction devices in home context for instance, leads audio programmes to interfere among listeners within the same room. In order to tackle this problem, multizone audio reproduction, also known as personal sound zones, is a domain of interest for more than a decade. Many spatial audio techniques are used such as High Order Ambisonics (HOA), Spatial Decomposition Method (SDM), or sound field optimization like Acoustic Contrast Control (ACC), Planarity Control (PC) or Pressure Matching (PM) methods. Most of previous work focuses on soundfield reproduction for multiples listeners at fixed positions and few attempts were made for moving listeners. To create moving sound zones, adaptive filtering process is needed. In a previous study, various adaptive algorithms such as LMS, NLMS, and RLS filters were assessed by the authors for a simple configuration of sound field reproduction (i.e. one single moving zone). The method based on a weighted least square optimization was selected as the most flexible method in terms of sound field reproduction quality and contrast between zones. In the current paper, this method is now applied to multi-user reproduction. The problem is separated in two sub-problems. The first sub-problem consists in a zone A where a first spatial audio programme is reproduced for one listener (i.e. bright zone) and a zone B where the resulting acoustic pressure is minimized for a second listener (i.e. dark zone). The second sub-problem is the reciprocal configuration for a second spatial audio programme, which is reproduced in zone B and minimized in zone A. The study mainly focuses on the influence of the position and motion of the dark zone. Free field simulations will illustrate the impact on both the adaptive filtering process and the quality of the reproduced sound field.