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Reproduction of loud low-frequency soundfields with Boundary Surface Control

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Many research works have focused on multichannel soundfield reproduction during the past decade, and complete systems are now commercially available for 3D sound control e.g. with Wave Field Synthesis. However, the usual underlying approximation of free-field propagation is not valid when reproducing high level low frequency noise, such as a sonic boom, inside a closet; a specific sound control strategy is required in this case. In this context the paper presents an experiment of low-frequency soundfield reproduction with open-loop control of the acoustic pressure at a set of 30 microphones enclosing a listening area. It is shown that this so-called Boundary Surface Control strategy allows an accurate reproduction of 3D soundfields inside the LMA sonic boom closet, equipped with 16 wall-embedded noise sources, at frequencies from 3 to 200Hz.