

ACOUSTICS2008/1921
Synthesis of wave front in the sound field recording/reproduction system based on the boundary surface control principle

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Based on the boundary surface control (BSC) principle, a new recording/reproduction system is developed to realize high fidelity three-dimensional sound field reproduction. Theoretically, by using this new system, physically faithful reproduction could be achieved in any acoustic environments.

Sound recording/reproduction systems based on the BSC principle require many loudspeakers and many microphones. In this new system, the microphone array system to record 3D sound field consists of 70 microphones, and the loudspeaker system to reproduce the recorded 3D sound field consists of 62 full-range units and 8 sub-woofer units.

To evaluate the ability of this system, the wave front which is measured in the soundproofed room is compared with the reconstructed wave front within this system. The experiment shows that the reconstructed secondary wave front is very similar to the primary wave front in lower frequency.