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Personal sound system design for mobile phone, monitor, and television set: cylindrical shape approach

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Personal sound system that focuses sound on the user and reduces in the other zone has great interest in these days because it has significant needs to be applied in personal devices such as mobile phone, monitor, and television set. We have shown the feasibility of the personal sound system using a line array of loudspeaker units [C.-H. Lee et. al., J. Acoust. Soc. Am., 122, 3053 (2007)] based on acoustic contrast control [J.-W. Choi, Y.-H. Kim, J. Acoust. Soc. Am. 111, 1695(2002)], with the successful result of about 20dB difference between the front and the side region for 800-5kHz range. Continuing this research, we try to apply acoustic contrast control in cylindrical shape instead of two-dimensional planar shape that was used before in order to reduce the level of side lobes more. That is, acoustically bright zone and dark zone are determined as cylindrical shape surrounding the array of loudspeakers. Computer simulation and experimental result will be addressed and evaluated by comparing to the previous result. (This work was supported by the Korea Science and Engineering Foundation(KOSEF) through the National Research Lab. Program funded by the Ministry of Science and Technology(M10500000112-05J0000-11210).)