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Sound localization in multiple regions: theory and applications

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It is often required to have several listening zones, which allows us to have different sounds that we select. For example, in a room, someone wants to listen sound from TV set, and other wants to listen music. In a car, a driver might wants to hear the information coming from his/her navigator system, and the passenger at the back side wants have a quiet zone so that he/she can sleep. To accomplish this kind of acoustic zones, we need to generate multiple sound zones by using multiple speakers. The performance has to be evaluated in accordance with how well one can listen the sound that is expected to have. We proposed to maximize the acoustic contrast between the zones that are defined. The basic concept associated with this approach was proposed by Choi and Kim [J. Acoust. Soc. Am., Vol.111(4), 1695-1700, Apr. 2002.], but this paper extend this fundamental idea to multiple zone cases. Theoretical formulation which shows what we have proposed is well addressed and several practical cases, including car audio system will be demonstrated. [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)]