

Subjective impression of differences in realism, source width, and orientation between auralizations created from multi-channel anechoic recordings.

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Auralizations can be very useful in the design of performing arts spaces. One of the fundamental modeling inputs to create auralizations is the source directivity. Standard methods involve inputting the measured source directivity, calculating the impulse response (IR) and convolving it with a single channel anechoic recording. This paper focuses on an alternative method of modeling source directivity which involves multi-channel anechoic recordings to create auralizations. Subjective tests were conducted comparing auralizations made with one, four and thirteen channels for differences in realism and source width. Auralizations were made using three different types of musical instruments: woodwinds (flute), brass (trombone) and strings (violin). Subjects were asked to rate each musical track on a seven-point scale for the degree of realism and source width. An analysis of variance (ANOVA) was carried out to determine the differences between the number of channels and the effect of instrument. A second test was conducted to assess the degree of difficulty in detecting source orientation (facing the audience or facing the stage wall) depending on the number of channels (one, four or thirteen) and the amount of absorption in the room. [Work supported by the National Science Foundation.]

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