

ACOUSTICS2008/2510

Auralization of an orchestra with phase-shifted string sections

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Orchestra auralizations have been created in ODEON using multi-channel individual instrument anechoic recordings of two symphonies; however, only one or two string instruments were recorded to represent each string section. To simulate the chorus effect of an entire string section more accurately, the anechoic tracks of the single string instruments have been mixed with other versions of the same signal, each with some phase shift in time. Two groups of phase shifts were used: one with shorter delays of up to 23 ms, and one with longer delays of up to 47 ms. A maximum of seven differently phase-shifted signals were combined with the original to create a final anechoic recording for use in the auralizations, depending on the number of players each source represented. Using paired comparisons, test subjects were asked to identify the auralization that sounded most similar to the experience of listening to an orchestra in an actual concert hall: one having none, short or long phase-shifts. Results show that subjects have difficulty differentiating between these three types of auralizations, indicating that phase shifting may not be required for such multi-source multi-channel orchestra auralizations. [Work supported by the National Science Foundation.]