

## **Auralization of an orchestra with phase-shifted string sections.**

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Orchestra auralizations were created using multi-channel individual instrument anechoic recordings of two symphonies. The string sections were modeled with one or two individual sources and the anechoic recordings were initially processed to add phase shifting. Each individual string channel recording was processed to have short delays of up to 23 ms for the “short” phase shifted signals and up to 47 ms for the “long” phase shifted signals. A maximum of seven phase shifts were applied to the original signal individually, depending on the number of players each point source represented, and then all signals were combined to create a final phase-shifted anechoic recording for use in the auralizations. The process was repeated with the same phase-shifts for all five channels. Subjects were presented pairs of auralizations that contained a comparison between one of three levels of phase-shifting: none, short and long phase-shifts. In addition, the number of channels used in the auralizations was varied by using either one or five channels. The subjects’ task was to choose the auralization that sounded most similar to the experience of listening to an orchestra in an actual concert hall. [Work supported by the National Science Foundation.]

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