

3aSP10. A unified approach for the spatial enhancement of sound.

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This paper aims to control the sound field spatially, so that the desired or target acoustic variable is enhanced within a zone where a listener is located. This is somewhat analogous to having manipulators that can draw sounds in any place. This also means that one can somehow see the controlled shape of sound in frequency or in real time. The former assures its practical applicability, for example, listening zone control for music. The latter provides a mean of analyzing sound field. With all these regards, a unified approach is proposed that can enhance selected acoustic variables using multiple sources. Three kinds of acoustic variables that have to do with magnitude and direction of sound field are formulated and enhanced. The first one, which has to do with the spatial control of acoustic potential energy, enables one to make a zone of loud sound over an area. Otherwise, one can control directional characteristic of sound field by controlling directional energy density, or one can enhance the magnitude and direction of sound at the same time by controlling acoustic intensity. Throughout various examples, it is shown that these acoustic variables can be controlled successfully by the proposed approach.