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Software Implementation of B-Format Encoding and Decoding

New software tools are presented, which enable a standard PC equipped with a multichannel sound board to be used both for the creation of B-format signals, and for their playback over a suitable array of loudspeakers. The encoding of B-format signals is obtained by convolution of each original soundtrack with a proper B-format impulse response, obtained from measurement in existing spaces or from computation by a room acoustics software. The decoding is made thanks to a small dedicated program, which can be set to emulate a standard Ambisonics decoder (with fixed-gain shelf filters), or a new, wider class of decoders based on the recent theory about Energetic Analysis of Sound Fields. The decoder includes convolution with inverse filters which compensate for the irregularities of the loudspeakers. The system was developed mainly as an analysis tool and as a support for subjective listening tests in the automotive field and in the room acoustics field.

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