CLAIMS

1. A method performed in an audio decoder for reconstructing N audio channels from an audio signal having M audio channels, the method comprising:

receiving a bitstream containing the M audio channels and a set of spatial parameters, wherein the set of spatial parameters includes an amplitude parameter and a correlation parameter;

decoding the M encoded audio channels, wherein each audio channel is divided into a plurality of frequency bands, and each frequency band includes one or more spectral components;

extracting the set of spatial parameters from the bitstream;

analyzing the M audio channels to detect a location *(presence?)* of a transient;

decorrelating the M audio channels to obtain a decorrelated version of the M audio channels, wherein a first decorrelation technique is applied to a first subset of the plurality of frequency bands of each audio channel and a second decorrelation technique is applied to a second subset of the plurality of frequency bands of each audio channel;

deriving N audio channels from the M audio channels, the decorrelated version of the M audio channels, and the set of spatial parameters, wherein N is two or more, M is one or more, and M is less than N; and

synthesizing, by an audio reproduction device, the N audio channels as an output audio signal,

wherein both the analyzing and the decorrelating are performed in a frequency domain, the first decorrelation technique represents a first mode of operation of a decorrelator, the second decorrelation technique represents a second mode of operation of the decorrelator, and the audio decoder is implemented at least in part in hardware.

2. The method of claim 1 wherein the analyzing occurs after the extracting and the deriving occurs after the decorrelating.

3. The method of claim 1 wherein the first subset of the plurality of frequency bands is at a higher frequency than the second subset of the plurality of frequency bands.

4. The method of claim 1 wherein the location of the transient is used in the decorrelating to process bands with a transient differently than bands without a transient.

5. The method of claim 4 wherein the N audio channels represent a stereo audio signal where N is two and M is one.

6. The method of claim 1 wherein the N audio channels represent a stereo audio signal where N is two and M is one.

7. The method of claim 1 wherein the first subset of the plurality of frequency bands is non-overlapping but contiguous with the second subset of the plurality of frequency bands.

8. A computer readable medium containing instructions that when executed by a processor perform the method of claim 1.

9. An audio decoder for decoding M encoded audio channels representing N audio channels, the audio decoder comprising:

an input interface for receiving a bitstream containing the M encoded audio channels and a set of spatial parameters, wherein the set of spatial parameters includes an amplitude parameter and a correlation parameter;

an audio decoder for decoding the M encoded audio channels, wherein each audio channel is divided into a plurality of frequency bands, and each frequency band includes one or more spectral components;

a demultiplexer for extracting the set of spatial parameters from the bitstream;

a processor for analyzing the M audio channels to detect a location of a transient;

a decorrelator for decorrelating the M audio channels, wherein a first decorrelation technique is applied to a first subset of the plurality of frequency bands of each audio channel and a second decorrelation technique is applied to a second subset of the plurality of frequency bands of each audio channel;

a reconstructor for deriving N audio channels from the M audio channels and the set of spatial parameters, wherein N is two or more, M is one or more, and M is less than N; and

an audio reproduction device that synthesizes the N audio channels as an output audio signal,

wherein both the analyzing and the decorrelating are performed in a frequency domain, the first decorrelation technique represents a first mode of operation of a decorrelator, and the second decorrelation technique represents a second mode of operation of the decorrelator.