Claims

1. Apparatus for generating a decoded two-channel signal, comprising:

an audio processor for decoding an encoded two-channel signal to obtain a first set of first spectral portions;

a parametric decoder for providing parametric data for a second set of second spectral portions and a two-channel identification identifying either a first or a second different two-channel representation for the second spectral portions; and

a frequency regenerator for regenerating a second spectral portion of the second set of second spectral portions depending on a first spectral portion of the first set of first spectral portions, the parametric data for the second spectral portion and the two-channel identification for the second spectral portion,

wherein the audio processor is configured to decode the first set of first spectral portions in accordance with a further two-channel identification for the first set of first spectral portions and to transform the first set of first spectral portions so that a first two-channel representation of the first set of first spectral portions and a second two-channel representation of the first set of first spectral portions is obtained, and

wherein the frequency regenerator is configured to use either the first two-channel representation of the first set of first spectral portions or the second two-channel representation of the first set of first spectral portions as indicated in the two-channel identification for the second spectral portion.

2. Apparatus of claim 1, wherein the two-channel identification identifies either a separate processing of two channels of the encoded two-channel signal or a joint processing of the two channels of the encoded two-channel signal, and

wherein the frequency regenerator is configured for regenerating the second spectral portion for a first channel of the two channels and the second spectral portion for a second channel of the two channels using the first spectral portion of the first channel and the first spectral portion of the second channel, wherein the first spectral portion

of the first channel and the first spectral portion of the second channel are in a two-channel representation identified by the two-channel identification for the second spectral portion.

3. Apparatus of claim 1 or 2,

wherein the two-channel identification identifies either a separate processing of two channels of the encoded two-channel signal or a joint processing of the two channels of the encoded two-channel signal, and

wherein the frequency regenerator is configured for regenerating a joint representation of the two channels in the second spectral portion as identified by the two-channel identification, and

wherein the frequency regenerator further comprises a representation transformer for transforming the joint representation of the second spectral portion into a separate representation for the second spectral portion.

4. Apparatus of claim 3, wherein the representation transformer uses additional joint representation parameters for the representation transformation.

5. Apparatus of claim 3, wherein the joint representation is a mid/side representation, and wherein the representation transformer is configured to operate based on the following equation:

$$leftTile = 0.5 * (midTile + sideTile)$$
$$rightTile = 0.5 * (midTile - sideTile)$$

wherein leftTile and rightTile are the separate representation for the second spectral portion, and wherein midTile and sideTile are the joint representation for the second spectral portion.

6. Apparatus of claim 3, wherein the joint representation is a representation comprising an additional prediction coefficient, and wherein the representation transformer is configured to operate based on the following equation:

$$sideTile[k] = sideTile[k] - predictionCoeff \cdot midTile[k]$$
$$leftTile[k] = midTile[k] + sideTile[k]$$
$$rightTile[k] = midTile[k] - sideTile[k]$$

when a prediction direction is from mid to side, or

$$midTile1[k] = midTile[k] - predictionCoeff \cdot sideTile[k]$$
$$leftTile[k] = midTile1[k] - sideTile[k]$$
$$rightTile[k] = midTile1[k] + sideTile[k]$$

when a prediction direction is indicated from side to mid,

wherein leftTile and rightTile are the separate representation for the second spectral portion, and wherein midTile and sideTile are the joint representation for the second spectral portion, and wherein predictionCoefficient is the additional prediction coefficient.

7. Apparatus of one of the preceding claims,

wherein the parametric data for the second set of second spectral portions is separately given for each channel of the two-channel representation, and

wherein the frequency regenerator is configured for transforming the parametric data for the second spectral portion into a joint representation for the second spectral portion and for applying the parametric data to a joint representation of the first spectral portion, when the two-channel identification identifies the joint representation for the second spectral portion.

8. Apparatus of one of the preceding claims, wherein the second spectral portions correspond to frequency bands, and wherein the two-channel identification is an array of flags, one flag for each frequency band, and wherein the parametric decoder is configured to check, whether the flag is set or not and to control the frequency regeneration in accordance with the flag to use either a first two channel representation or a second two channel representation of the first spectral portion of the encoded two-channel signal.

9. Apparatus of any one of the preceding claims, wherein the parametric decoder is configured to provide the further two-channel identification for the first set of first

spectral portions indicating either a first or a second different two-channel representation for the first spectral portion, and

wherein the apparatus is configured for decoding the second two-channel representation as indicated by the two-channel identification for the first spectral portion, and

wherein the frequency regenerator is configured for transforming the second two-channel representation into the first two-channel representation subsequent to the core decoding.

10. Apparatus of one of the preceding claims, further comprising a combiner for combining the first set of first spectral portions generated by the audio processor and the reconstructed second spectral portion generated by the frequency regenerator to obtain the decoded two-channel signal.

11. Apparatus of one of the preceding claims,

wherein the parametric decoder is configured for additionally providing, for the second spectral portion, a source band identification indicating a specific first spectral portion to be used for regenerating the second spectral portion, and

wherein the frequency regenerator is configured to regenerate the second spectral portion using the first spectral portion identified by the source band identification.

12. Apparatus of one of the preceding claims,

wherein the frequency regenerator comprises a representation transformer for providing the first and the second two-channel representation of a first set of first spectral portions generated by the audio processor,

wherein the frequency regenerator further comprises a frequency tile generator for generating raw data for each channel of the channel representation identified by the two-channel identification and using a source range identification indicating first spectral portions to be used for generating the raw data,

wherein the frequency regenerator further comprises a parameter transformer for transforming parameters provided in a first two-channel representation into a second two-channel representation for the parameters, when the raw data for each channel are provided in the second two-channel representation by the frequency tile generator,

wherein the frequency regenerator further comprises an envelope adjuster for adjusting an envelope of each channel of the two-channel representation, the two-channel representation being the second two-channel representation,

wherein the frequency regenerator further comprises a representation transformer for transforming the two-channel representation of spectral values in the second spectral portion into the first two-channel representation,

wherein the apparatus further comprises a frequency-time converter for converting a representation generated by the representation transformer from a spectral domain into a time domain.

13. Audio encoder for encoding a two-channel audio signal, comprising:

a time-spectrum converter for converting the two-channel audio signal into a spectral representation;

a spectral analyzer for providing an indication of a first set of first spectral portions to be encoded with a first spectral resolution and of a second set of second spectral portions to be encoded by a second spectral resolution, the second spectral resolution being smaller than the first spectral resolution,

a two-channel analyzer for analyzing bands of the two-channel audio signal within a reconstruction range to determine a two-channel identification for a reconstruction band either identifying a first two-channel representation or a second two-channel representation, wherein the reconstruction band comprises a second spectral portion of the second set of second spectral portions;

a core encoder for encoding the first set of first spectral portions to provide a first encoded representation; and

a parameter calculator for calculating parametric data on the second set of second spectral portions to obtain an encoded parametric representation,

wherein an encoded two-channel audio signal comprises the first encoded representation, the encoded parametric representation and the two-channel identification for the second set of second spectral portions.

14. Audio encoder of claim 13, further comprising a band wise transformer for transforming the first spectral portions into a two-channel representation indicated by the two-channel identification and wherein the spectral analyzer is configured for analyzing the two-channel representation output by the band wise transformer.

15. Audio encoder of one of claims 13 or 14,

wherein the two-channel analyzer is configured for performing a correlation calculation between a second spectral portion of the first channel of the two-channel representation and a second spectral portion of the two-channels of the two-channel representation to determine either a separate two-channel representation or a joint two-channel representation.

16. Audio encoder in accordance with one of claims 13 to 15,

wherein the spectral analyzer is configured for comparing matching results for different spectral portions of at least one channel of the two-channel representation to a different first spectral portion of at least one channel of the two-channel representation to determine a matching pair of a first spectral portion of at least one channel and the second spectral portion of at least one channel and to provide a matching indication for a best matching pair, and

wherein the audio encoder is configured to output, in addition to the encoded two-channel audio signal, the matching indication for the second spectral portion.

17. Audio encoder of one of claims 13 to 16 comprising the band wise transformer having an input connected to an output of the time-spectrum converter,

wherein the spectral analyzer is configured to receive, as an input, an output of the band wise transformer;

wherein the two-channel analyzer is configured for analyzing the output of the time-spectrum converter and for providing an analysis result to control the band wise transformer,

wherein the audio encoder is configured to encode the output of the band wise transformer as controlled by the spectral analyzer, so that only the first set of first spectral portions is encoded by the core encoder, and

wherein the parameter calculator is configured for parametrically encoding the second set of second spectral portions as indicated by the spectral analyzer in the output of the band wise transformer.

18. Method of generating a decoded two-channel signal, comprising:

decoding an encoded two-channel signal to obtain a first set of first spectral portions;

providing parametric data for a second set of second spectral portions and a two-channel identification identifying either a first or a second different two-channel representation for the second spectral portions; and

regenerating a second spectral portion of the second set of second spectral portions depending on a first spectral portion of the first set of first spectral portions, the parametric data for the second spectral portion and the two-channel identification for the second spectral portion,

wherein the decoding comprises decoding the first set of first spectral portions in accordance with a further two-channel identification for the first set of first spectral portions and transforming the first set of first spectral portions so that a first two-channel representation of the first set of first spectral portions and a second two-channel representation of the first set of first spectral portions is obtained, and

wherein the regenerating comprises using either the first two-channel representation of the first set of first spectral portions or the second two-channel representation of the first set of first spectral portions as indicated in the two-channel identification for the second spectral portion.

19. Method of encoding a two-channel audio signal, comprising:

converting the two-channel audio signal into a spectral representation;

providing an indication of a first set of first spectral portions to be encoded with a first spectral resolution and of a second set of second spectral portions to be encoded by a second spectral resolution, the second spectral resolution being smaller than the first spectral resolution;

analyzing bands of the two-channel audio signal within a reconstruction range to determine a two-channel identification for a reconstruction band either identifying a first two-channel representation or a second two-channel representation, wherein the reconstruction band comprises a second spectral portion of the second set of second spectral portions;

encoding the first set of first spectral portions to provide a first encoded representation; and

calculating parametric data on the second set of second spectral portions to obtain an encoded parametric representation,,

wherein an encoded two-channel audio signal comprises the first encoded representation, the encoded parametric representation and the two-channel identification for the second set of second spectral portions.

20. Computer program for performing, when running on a computer or a processor, one of the methods of claim 18 or 19.