Claims

1. Apparatus for encoding a plurality of audio objects, comprising:

an object parameter calculator configured for calculating, for a frequency bin of a plurality of frequency bins related to a time frame, parameter data for at least two relevant audio objects, wherein a number of the at least two relevant audio objects is lower than a total number of the plurality of audio objects for the frequency bin of the plurality of frequency bins related to the time frame,

wherein the object parameter calculator is configured for performing a selection of the number of the at least two relevant audio objects and for not indicating the total number of the plurality of audio objects as being relevant,

wherein the selection is performed by means of relevance, and the relevance is determined by means of an amplitude-related measure, and audio objects having the most relevant amplitude-related measures are selected to be the at least two relevant audio objects of the number of the at least two relevant audio objects, if a certain number of relevant audio objects is available for the frequency bin, and

an output interface for outputting an encoded audio signal comprising information on the parameter data for the at least two relevant audio objects of the number of the at least two relevant audio objects.

2. Apparatus of claim 1, wherein the object parameter calculator is configured

to convert each audio object of the plurality of audio objects into a spectral representation having the plurality of frequency bins,

to calculate a selection information from each audio object for the frequency bin, and

to derive object identifications as the parameter data indicating the at least two relevant audio objects, based on the selection information, and

wherein the output interface is configured to introduce information on the object identifications into the encoded audio signal.

3. Apparatus of claim 1 or 2, wherein the object parameter calculator is configured to quantize and encode one or more of the amplitude-related measures or one or more combined values derived from the amplitude-related measures of the at least two relevant audio objects in the frequency bin as the parameter data, and

wherein the output interface is configured to introduce the quantized one or more amplitude related measure or the quantized one or more combined values into the encoded audio signal.

4. Apparatus of claim 2,

wherein the selection information is the amplitude-related measure for the audio object, and

wherein the object parameter calculator is configured to calculate a combined value, and

wherein the output interface is configured to introduce an information on the combined value into the encoded audio signal, wherein a number of information items on the combined values in the encoded audio signal is equal to at least one and is lower than the number of the at least two relevant audio objects for the frequency bin.

5. Apparatus of claim 4,

wherein the amplitude-related measure is selected from a group comprising an amplitude value, a power value or a loudness value or an amplitude raised to a power being different from one.

6. Apparatus of claim 4 or 5, wherein the combined value is a ratio from the amplitude-related measure of a relevant audio object of the at least two relevant audio objects and a sum of two or more amplitude-related measures of the at least two relevant audio objects.

7. Apparatus of one of claims 2 and 4 to 6,

wherein the object parameter calculator is configured to select the object identifications based on an order of the selection information of the plurality of audio objects in the frequency bin.

8. Apparatus of one of claims 2, 4 to 7, wherein the object parameter calculator is configured

to calculate a signal power as the selection information,

to derive the object identifications for the two or more audio objects having the greatest signal power values in a corresponding one or more frequency bins for each frequency bin separately,

to calculate a power ratio between the sum of the signal powers of the two or more audio objects having the greatest signal power values and the signal power of each of the audio objects having the derived object identifications as the parameter data, and

to quantize and encode the power ratio, and

wherein the output interface is configured to introduce the quantized and encoded power ratio into the encoded audio signal.

9. Apparatus of one of claims 1 to 6, wherein the output interface is configured to introduce, into the encoded audio signal,

one or more encoded transport channels,

as the parameter data, two or more encoded object identifications for the relevant audio objects for each one of the frequency bin of the plurality of frequency bins in the time frame, and one or more encoded combined values or encoded amplitude related measures, and

quantized and encoded direction data for each audio object in the time frame, the direction data being constant for all frequency bins of the one or more frequency bins.

10. Apparatus of one of claims 1 to 9, wherein the object parameter calculator is configured to calculate the parameter data for at least the most dominant object and the second most dominant object in the one or more frequency bins, wherein the most dominant object and the second most dominant object represent the number of the at least two relevant audio objects, or

wherein the total number of the plurality of audio objects is three or more, the plurality of audio objects comprising a first audio object, a second audio object and a third audio object, and

wherein the object parameter calculator is configured to calculate for a first one of one or more frequency bins, as the number of the at least two relevant audio objects, only a first group of audio objects such as the first audio object and the second audio object, and to calculate, as the number of the at least two relevant audio objects for a second frequency bin of the one or more frequency bins, only a second group of audio objects, such as the second audio object and the third audio object or the first audio object and the third audio object, wherein the first group of audio objects is different from the second group of audio objects at least with respect to one group member.

11. Apparatus of one of claims 1 to 10, wherein the object parameter calculator is configured

to calculate raw parametric data with a first time or frequency resolution and to combine the raw parametric data into combined parametric data having a second time or frequency resolution being lower than the first time of frequency resolution, and, and to calculate the parameter data for the at least two relevant audio objects with respect to the combined parametric data having the second time or frequency resolution, or

to determine parameter bands having a second time or frequency resolution being different from a first time or frequency resolution used in a time or frequency

decomposition of the plurality of audio objects, and to calculate the parameter data for the at least two relevant audio objects for the parameter bands having the second time or frequency resolution.

12. Apparatus of claim 1, wherein the object parameter calculator is configured to select the objects of the plurality of audio objects having the highest power among the total number of audio objects as the at least two relevant audio objects of the number of the at least two relevant audio objects.

13. Apparatus of one of the preceding claims, wherein the plurality of audio objects comprise related metadata indicating direction information on the plurality of audio objects, and

wherein the apparatus further comprises:

a downmixer for downmixing the plurality of audio objects to obtain one or more transport channels, wherein the downmixer is configured to downmix the plurality of audio objects in response to the direction information on the plurality of audio objects; and

a transport channel encoder for encoding one or more transport channels to obtain one or more encoded transport channels; and

wherein the output interface is configured to introduce the one or more transport channels into the encoded audio signal.

14. Apparatus of claim 13, wherein the downmixer is configured

to generate two transport channels as two virtual microphone signals arranged at the same position and having different orientations or at two different positions with respect to a reference position or orientation such as a virtual listener position or orientation, or

to generate three transport channels as three virtual microphone signals arranged at the same position and having different orientations or at three different positions

with respect to a reference position or orientation such as a virtual listener position or orientation, or

to generate four transport channels as four virtual microphone signals arranged at the same position and having different orientations or at four different positions with respect to a reference position or orientation such as a virtual listener position or orientation, or

wherein the virtual microphone signals are virtual first order microphone signals, or virtual cardioid microphone signals, or virtual figure of 8 or dipole or bidirectional microphone signals, or virtual directional microphone signals, or virtual subcardioid microphone signals, or virtual unidirectional microphone signals, or virtual hypercardioid microphone signals, or virtual omnidirectional microphone signals

15. Apparatus of claim 13 or 14, wherein the downmixer is configured

to derive, for each audio object of the plurality of audio objects, a weighting information for each transport channel using the direction information for the corresponding audio object;

to weight the corresponding audio object using the weighting information for the audio object for a specific transport channel to obtain an object contribution for the specific transport channel, and

to combine the object contributions for the specific transport channel from the plurality of audio objects to obtain the specific transport channel.

15. Apparatus of one of the claims 12 to 14,

wherein the downmixer is configured to calculate the one or more transport channels as one or more virtual microphone signals arranged at the same position and having different orientations or at different positions with respect to a reference position or orientation such as a virtual listener position or orientation, to which the direction information is related,

wherein the different positions or orientations are on or to a left side of a center line and on or to a right side of the center line, or wherein the different positions or orientations are equally or non-equally distributed to horizontal positions or orientations such as +90 degrees or -90 degrees with respect to the center line or -120 degrees, 0 degrees and +120 degrees with respect to the center line, or wherein the different positions or orientations comprise at least one position or orientation being directed upwards or downwards with respect to a horizontal plane in which a virtual listener is placed, wherein the direction information on the plurality of audio objects is related to the virtual listener position or reference position or orientation.

16. Apparatus in accordance with one of the claims 12 to 15, further comprising:

a parameter processor for quantizing the metadata indicating the direction information on the plurality of audio objects to obtain quantized direction items for the plurality of audio objects,

wherein the downmixer is configured to operate in response to the quantized direction items as the direction information, and

wherein the output interface is configured to introduce information on the quantized direction items into the encoded audio signal.

17. Apparatus of one of the claims 12 to 16,

wherein the downmixer is configured to perform an analysis of the direction information on the plurality of audio objects and to place one or more virtual microphones for the generation of the transport channels depending on a result of the analysis.

18. Apparatus of one of the claims 12 to 17,

wherein the downmixer is configured to downmix using a downmixing rule being static over the plurality of time frames, or

wherein the direction information is variable over a plurality of time frames, and wherein the downmixer is configured to downmix using a downmixing rule being variable over the plurality of time frames.

19. Apparatus of one of the claims 12 to 18, wherein the downmixer is configured to downmix in a time domain using a sample-by-sample weighting and combining of samples of the plurality of audio objects.

20. Method of encoding a plurality of audio objects, comprising:

calculating, for a frequency bin of a plurality of frequency bins related to a time frame, parameter data for at least two relevant audio objects, wherein a number of the at least two relevant audio objects for the frequency bin of the plurality of frequency bins related to the time frame is lower than a total number of the plurality of audio objects,

wherein the calculating comprises performing a selection of the number of the at least two relevant audio objects and not indicating the total number of the plurality of audio objects as being relevant,

wherein the selection is performed by means of relevance, and the relevance is determined by means of an amplitude-related measure, and audio objects having the most relevant amplitude-related measures are selected to be the at least two relevant audio objects of the number of the at least two relevant audio objects, if a certain number of relevant audio objects is available for the frequency bin; and

outputting an encoded audio signal comprising information on the parameter data for the at least two relevant audio objects of the number of the at least two relevant audio objects.

21. Computer program for performing, when running on a computer or a processor, the method of claim 20.