Claims:

1. A method of decoding a compressed Higher Order Ambisonics (HOA) representation of a sound or sound field, the method comprising:

receiving a bit stream containing the compressed HOA representation corresponding to a plurality of hierarchical layers that include a base layer and one or more hierarchical enhancement layers, wherein the plurality of layers have assigned thereto components of a basic compressed sound representation of the sound or sound field, the components being assigned to respective layers in respective groups of components,

determining a highest usable layer among the plurality of layers for decoding;

extracting a HOA extension payload assigned to the highest usable layer, wherein the HOA extension payload includes side information for parametrically enhancing a reconstructed HOA representation corresponding to the highest usable layer, wherein the reconstructed HOA representation corresponding to the highest usable layer is obtainable on the basis of the transport signals assigned to the highest usable layer and any layers lower than the highest usable layer;

decoding the compressed HOA representation corresponding to the highest usable layer based on layer information, the transport signals assigned to the highest usable layer and any layers lower than the highest usable layer; and

parametrically enhancing the decoded HOA representation using the side information included in the HOA extension payload assigned to the highest usable layer.

2. An apparatus for decoding a compressed Higher Order Ambisonics (HOA) representation of a sound or sound field, the apparatus comprising:

a receiver configured to receive a bit stream containing the compressed HOA representation corresponding to a plurality of hierarchical layers that include a base layer and one or more hierarchical enhancement layers, wherein the plurality of layers have assigned thereto components of a basic compressed sound representation of the sound or sound field, the components being assigned to respective layers in respective groups of components,

a decoder configured to:

determine a highest usable layer among the plurality of layers for decoding;

extract a HOA extension payload assigned to the highest usable layer, wherein the HOA extension payload includes side information for parametrically enhancing a reconstructed HOA representation corresponding to the highest usable layer, wherein the reconstructed HOA representation corresponding to the highest usable layer is obtainable on the basis of the transport signals assigned to the highest usable layer and any layers lower than the highest usable layer;

decode the compressed HOA representation corresponding to the highest usable layer based on layer information, the transport signals assigned to the highest usable layer and any layers lower than the highest usable layer; and

parametrically enhance the decoded HOA representation using the side information included in the HOA extension payload assigned to the highest usable layer.

3. The method of claim 1, wherein the HOA extension payload include bit stream elements for a HOA spatial signal prediction decoding tool.

4. The method of claim 1, wherein the layer information indicates a number of active directional signals in a current frame of an enhancement layer.

5. The method of claim 1, wherein the layer information indicates a total number of additional ambient HOA coefficients for an enhancement layer.

6. The method of claim 1, wherein the layer information includes HOA coefficient indices for each additional ambient HOA coefficient for an enhancement layer.

7. The method of claim 1, wherein the layer information includes enhancement information that includes at least one of Spatial Signal Prediction, the Sub-band Directional Signal Synthesis and the Parametric Ambience Replication Decoder.

8. The method of claim 1, wherein the compressed HOA representation is adapted for a layered coding mode for HOA based content if a CodedVVecLength equal to one is signaled in the HOADecoderConfig().

9. The method of claim 1, further including v-vector elements that are not transmitted for indices that are equal to the indices of additional HOA coefficients included in a set of ContAddHoaCoeff.

10. The method of claim 1, wherein the set of ContAddHoaCoeff is separately defined for each of the plurality of hierarchical layers.

11. The method of claim 1, wherein the layer information includes NumLayers elements, where each element indicates a number of transport signals included in all layers up to an i-th layer.

12. The method of claim 1, wherein the layer information includes an indicator of all actually used layers for a k-th frame.

13. The method of claim 1, wherein the layer information indicates that all of the coefficients for the predominant vectors are specified.

14. The method of claim 1, wherein the layer information indicates that coefficients of the predominant vectors corresponding to the number greater than a MinNumOfCoeffsForAmbHOA are specified.

15. The method of claim 1, wherein the layer information indicates MinNumOfCoeffsForAmbHOA and all elements defined in ContAddHoaCoeff are not transmitted, where lay is the index of layer containing the vector based signal corresponding to the vector.

CLAIMS:

1. A method of decoding a compressed Higher Order Ambisonics (HOA) representation of a sound or sound field, the method comprising:

receiving a bit stream comprising the compressed HOA representation, wherein the bit stream comprises a plurality of hierarchical layers that comprise a base layer and one or more hierarchical enhancement layers, wherein the plurality of hierarchical layers comprise components of the compressed HOA representation of the sound or sound field;

determining a highest usable layer among the plurality of hierarchical layers for decoding;

extracting a HOA extension payload assigned to the highest usable layer, wherein the HOA extension payload includes side information for parametrically enhancing a reconstructed HOA representation corresponding to the highest usable layer and wherein the HOA extension payload include bit stream elements for HOA spatial signal prediction decoding, wherein the reconstructed HOA representation corresponding to the highest usable layer is obtainable on a basis of transport signals assigned to the highest usable layer and any layers lower than the highest usable layer;

decoding the compressed HOA representation corresponding to the highest usable layer based on layer information, - transport signals assigned to the highest usable layer and any layers lower than the highest usable layer; and

parametrically enhancing the decoded HOA representation using the side information included in the HOA extension payload assigned to the highest usable layer.

2. The method of claim 1, wherein the layer information indicates a total number of additional ambient HOA coefficients for an enhancement layer.

3. The method of claim 1, wherein the layer information includes enhancement information that includes at least one of Spatial Signal Prediction, Sub-band Directional Signal Synthesis and Parametric Ambience Replication Decoder.

4. The method of claim 1, further including v-vector elements that are not transmitted for indices that are equal to indices of additional HOA coefficients included in a set of ContAddHoaCoeff.

5. The method of claim 1, wherein the layer information includes NumLayers elements, where each element indicates a number of transport signals included in all layers up to an i-th layer.

6. The method of claim 1, wherein the layer information includes an indicator of all actually used layers for a k-th frame.

7. The method of claim 1, wherein the layer information indicates that coefficients for predominant vectors are specified.

8. The method of claim 1, wherein the layer information indicates that coefficients of the predominant vectors corresponding to a number greater than a MinNumOfCoeffsForAmbHOA are specified.

9. The method of claim 1, wherein the layer information indicates MinNumOfCoeffsForAmbHOA and all elements defined in ContAddHoaCoeff are not transmitted, where lay is an index of layer containing vector based signal corresponding to a vector.

10. A non-transitory computer readable medium containing instructions that when executed by a processor perform the method of claim 1.

11. An apparatus for decoding a compressed Higher Order Ambisonics (HOA) representation of a sound or sound field, the apparatus comprising:

a receiver configured to receive a bit stream comprising the compressed HOA representation, wherein the bit stream comprises a plurality of hierarchical layers that comprise a base layer and one or more hierarchical enhancement layers, wherein the plurality of hierarchical layers comprise components of the compressed HOA representation of the sound or sound field,

a decoder configured to:

determine a highest usable layer among the plurality of hierarchical layers for decoding;

extract a HOA extension payload assigned to the highest usable layer, wherein the HOA extension payload includes side information for parametrically enhancing a

reconstructed HOA representation corresponding to the highest usable layer and wherein the HOA extension payload include bit stream elements for HOA spatial signal prediction decoding, wherein the reconstructed HOA representation corresponding to the highest usable layer is obtainable on a basis of transport signals assigned to the highest usable layer and any layers lower than the highest usable layer;

decode the compressed HOA representation corresponding to the highest usable layer based on layer information, transport signals assigned to the highest usable layer and any layers lower than the highest usable layer; and

parametrically enhance the decoded HOA representation using the side information included in the HOA extension payload assigned to the highest usable layer.