CLAIMS

1. A method of decoding a bitstream indicative of a plurality of higher-order ambisonic (HOA) coefficients representative of a soundfield, the method comprising: obtaining, by an audio decoding device, the bitstream, wherein the bitstream includes a syntax element identifying whether the vector quantization or the scalar quantization was performed; performing, by the audio decoding device and based on the syntax element identifying whether the vector quantization or the scalar quantization was performed, either vector dequantization or scalar dequantization with respect to a spatial component defined in a spherical harmonic domain; reconstructing, by the audio decoding device, the plurality of HOA coefficients based on the dequantized spatial component; rendering, by the audio decoding device, one or more loudspeaker feeds based on the reconstructed plurality of HOA coefficients; and reproducing, by one or more loudspeakers coupled to the audio decoding device, the soundfield based on the one or more loudspeaker feeds.

2. The method of claim 1, further comprising performing the vector dequantization based on the determination.

3. The method of claim 2, wherein performing the vector dequantization comprises determining one or more weight values that represent a vector that is included in the spatial component, each of the weight values corresponding to a respective one of a plurality of weights included in a weighted sum of the code vectors that represents the vector.

4. The method of claim 3, wherein determining the weight values comprises determining a set of N weight values.

5. The method of claim 4, further comprising obtaining a bitstream that includes a syntax element indicative of which of the M greatest weight values were selected from a weight value codebook.

6. The method of claim 5, wherein the weight value codebook is one of a plurality of weight value codebooks, and wherein obtaining the bitstream comprises obtaining the bitstream that also includes a syntax element that identifies the weight value codebook of the plurality of weight value codebooks from which the M greatest weight values were selected.

7. The method of claim 3, further comprising determining which of the set of code vectors to use with a corresponding one of the weight values to represent the spatial component.

8. The method of claim 3, further comprising determining which of the set of code vectors to use with a corresponding one of the weight values to represent the decomposed version of the plurality of HOA coefficients based on a syntax element included in the bitstream indicative of a vector index.

9. The method of claim 1, wherein reconstructing the plurality of HOA coefficients includes reconstructing the plurality of HOA coefficients based on the spatial component and an audio object corresponding to the spatial component.

10. A device configured to decode a bitstream indicative of a plurality of higher-order ambisonic (HOA) coefficients representative of a soundfield, the device comprising: a memory configured to store the bitstream that includes a syntax element that identifies whether the vector quantization or the scalar quantization was performed; and one or more processors coupled to the memory, and configured to: perform, based on the syntax element that identifies whether the vector quantization or the scalar quantization was performed, either vector dequantization or scalar dequantization with respect to a spatial component defined in a spherical harmonic domain; reconstruct the plurality of HOA coefficients based on the dequantized spatial component; and render one or more loudspeaker feeds based on the reconstructed plurality of HOA coefficients; and one or more loudspeakers coupled to the processor, and configured to reproduce the soundfield based on the one or more loudspeaker feeds.

11. The device of claim 10, wherein the one or more processors are further configured to perform the scalar dequantization based on the determination.

12. The device of claim 11, wherein the one or more processors are further configured to obtain a bitstream that includes a field indicating a value that expresses a quantization step size or a variable thereof used when compressing the spatial component.

13. The device of claim 10, wherein the one or more processors are further configured to perform the vector dequantization with respect to a first portion of the spatial component based on the determination, and perform the scalar dequantization with respect to a second portion of the spatial component based on the determination.

14. The device of claim 10, wherein the one or more processors are configured to determine whether to perform the vector dequantization or the scalar dequantization with respect to the spatial component based on a threshold bitrate specified by the syntax element.

15. The device of claim 14, wherein the threshold bitrate comprises 256 kilobits per second (Kbps).

16. The device of claim 14, wherein the one or more processors are configured to determine to perform the vector dequantization with respect to the spatial component when the syntax element indicates that the threshold bitrate is equal to or below 256 kilobits per second (Kpbs).

17. The device of claim 14, wherein the one or more processors are configured to determine to perform the scalar dequantization with respect to the spatial component when the syntax element indicates that the threshold bitrate above 256 kilobits per second (Kpbs).

18. The device of claim 10, wherein the one or more processors are configured to reconstruct the plurality of HOA coefficients based on the spatial component and an audio object corresponding to the spatial component.

19. A method of encoding audio data indicative of a plurality of higher-order ambisonic (HOA) coefficients representative of a soundfield, the method comprising: capturing, by a microphone coupled to an audio encoding device, the audio data; and determining, by the audio encoding device, whether to perform vector quantization or scalar quantization with respect to a spatial component decomposed from the plurality of HOA coefficients; performing, by the audio encoding device and so as to generate a bitstream including an encoded version of the audio data, either the vector quantization or the scalar quantization with respect to the spatial component based on the determination; and specifying, by the audio encoding device and in the bitstream, a syntax element indicating whether the vector quantization or the scalar quantization was performed.

20. The method of claim 19, further comprising performing the vector quantization based on the determination.