CLAIMS

1. A method for audio signal encoding, the method comprising:

encoding a first frame of an audio signal using a first domain analysis at a first encoder;

generating, during encoding of the first frame, a baseband signal corresponding to a high band estimate of the audio signal or to a synthesized version of at least a portion of the audio signal; and

encoding a second frame of the audio signal using a second domain analysis at a second encoder by processing first data representing the baseband signal and second data representing a high band portion of the second frame to generate high band parameters associated with the second frame.

2. The method of claim 1, wherein the first domain analysis and the second domain analysis comprise a frequency domain analysis and a time domain analysis, respectively, and wherein the second frame sequentially follows the first frame in the audio signal.

3. The method of claim 1, wherein the first frame is encoded using a transform-based encoder.

4. The method of claim 1, wherein the first frame is encoded using a modified discrete cosine transform (MDCT) encoder.

5. The method of claim 1, wherein the second frame is encoded using a linear prediction (LP)-based encoder that stores the first data and the second data in a target signal buffer.

6. The method of claim 1, wherein the second frame is encoded using an algebraic code-excited linear prediction (ACELP) encoder configured to perform bandwidth extension.

7. The method of claim 1, wherein generating the baseband signal includes performing a flip operation and a decimation operation.

8. The method of claim 1, wherein generating the baseband signal does not include performing a high-order filtering operation and does not include performing a downmixing operation.

9. The method of claim 1, wherein the second encoder stores the first data in a first portion of a target signal buffer of the second encoder and stores the second data in a second portion of the target signal buffer.

10. The method of claim 1, wherein the first encoder encodes the first frame in a mobile communication device, and wherein the second encoder encodes the second frame in the mobile communication device.

11. The method of claim 1, wherein generating the baseband signal comprises using a local decoder of the first encoder, and further comprising copying the first data to a target signal buffer of the second encoder.

12. The method of claim 1, further comprising:

performing a flip operation and a decimation operation on the baseband signal to generate a result signal that approximates the high band portion of the audio signal; and

populating a target signal buffer of the second encoder based on the result signal.

13. A method for audio signal decoding, the method comprising:

receiving a bit stream of second bits based on a second frame of an audio signal encoded using a first domain analysis at a first encoder and of first bits based on a first frame of the audio signal encoded using a second domain analysis at a second encoder, the first frame encoded by processing first data representing a baseband signal and second data representing a high band portion of the first frame, wherein the baseband signal is produced by the first encoder based on a high band estimate of a third frame or based on a synthesized version of at least a portion of the third frame;

decoding, at a device that includes a first decoder and a second decoder, an encoded version of the first frame using the second decoder and the first bits, the second decoder generating overlap data that corresponds to a portion of the second frame; and

decoding an encoded version of the second frame using the first decoder and the second bits, the decoding including applying a smoothing operation using the overlap data from the second decoder.

14. The method of claim 13, wherein the first decoder comprises a modified discrete cosine transform (MDCT) decoder, wherein the second decoder comprises an algebraic code-excited linear prediction (ACELP) decoder that performs calculations based on bandwidth extension parameters, and wherein the overlap data comprises data corresponding to 20 audio samples of the second frame.

15. The method of claim 13, wherein the first domain analysis and the second domain analysis comprise a frequency domain analysis and a time domain analysis, respectively.

16. The method of claim 13, wherein the smoothing operation includes a crossfade operation, and wherein the first decoder and the second decoder are included in a mobile communication device.

17. An apparatus for audio signal encoding, the apparatus comprising:
an antenna;
a first encoder configured to:
encode a first frame of an audio signal based on a first domain analysis; and
generate, during encoding of the first frame, a baseband signal corresponding to a high band estimate of the audio signal or to a synthesized version of at least a portion of the audio signal;
a second encoder configured to encode a second frame of the audio signal based on:
a second domain analysis; and
first data representative of the baseband signal and second data representative of a high band portion of the second frame, the second encoder further configured to generate high band parameters associated with the second frame; and
a transmitter coupled to the antenna and configured to transmit an encoded audio signal associated with the baseband signal.

18. The apparatus of claim 17, wherein the first domain analysis and the second domain analysis comprise a frequency domain analysis and a time domain analysis, respectively, and wherein the second frame sequentially follows the first frame in the audio signal.

19. The apparatus of claim 17, wherein:
the first encoder comprises a modified discrete cosine transform (MDCT) encoder,
the second encoder comprises an algebraic code-excited linear prediction (ACELP) encoder configured to store at least one of the first data or the second data in a target signal buffer and to perform bandwidth extension, and
the first encoder and the second encoder are integrated into a mobile communication device.

20. The apparatus of claim 17, wherein the first encoder is further configured to generate the baseband signal using a flip operation and using a decimation operation without performing a high-order filtering operation and without performing a downmixing operation.

21. An apparatus for audio signal encoding, the apparatus comprising:
an antenna;

a first encoder configured to encode a first frame of an audio signal based on a first domain analysis;

a second encoder configured to:

during encoding of a second frame of the audio signal based on a second domain analysis, generate a signal estimate of a first portion of the first frame;

populate a buffer of the second encoder with first data based on the signal estimate and with second data representative of a high band portion of the second frame; and

generate high band parameters associated with the second frame based on the first data and the second data stored in the buffer; and

a transmitter coupled to the antenna and configured to transmit an encoded audio signal associated with the audio signal.

22. The apparatus of claim 21, wherein the signal estimate is based on an extrapolation operation, the extrapolation operation based on data of the second frame.

23. The apparatus of claim 21, wherein the signal estimate is based on a backward linear prediction.

24. The apparatus of claim 21, wherein the signal estimate is based on energy information that is indicative of an energy associated with the first frame.

25. The apparatus of claim 24, further comprising a first buffer coupled to the first encoder, wherein the energy associated with the first frame is determined based on a first energy associated with the first buffer, wherein the energy associated with the first frame is determined based on a second energy associated with a high band portion of the first buffer.

26. The apparatus of claim 21, further comprising a modulator configured to modulate the encoded audio signal.

27. The apparatus of claim 26, wherein the antenna, the transmitter, and the modulator are integrated into a mobile communication device.

28. The apparatus of claim 21, wherein the first domain analysis and the second domain analysis comprise a frequency domain analysis and a time domain analysis, respectively, wherein the signal estimate is based at least in part on a first frame type of the first frame, a second frame type of the second frame, or both, wherein the first frame type comprises a voiced frame type, an unvoiced frame type, a transient frame type, or a generic frame type, and wherein the second frame type comprises the voiced frame type, the unvoiced frame type, the transient frame type, or the generic frame type.

29. The apparatus of claim 21, wherein the first portion of the first frame is approximately 5 milliseconds in duration and wherein the second frame is approximately 20 milliseconds in duration.

30. The apparatus of claim 21, wherein the signal estimate is based on an energy associated with a locally decoded low band portion of the first frame, a locally decoded high band portion of the first frame, or both.

31. An apparatus for audio signal decoding, the apparatus comprising:

a receiver configured to receive a bit stream of second bits corresponding to a second frame of an audio signal encoded via a first domain analysis at a first encoder and of first bits corresponding to a first frame of the audio signal encoded via a second domain analysis at a second encoder, the first frame encoded by processing first data representative of a baseband signal and second data representative of a high band portion of the first frame, wherein the baseband signal is produced by the first encoder based on a high band estimate of a third frame or based on a synthesized version of at least a portion of the third frame;

a first decoder configured to, during decoding of an encoded version of the second frame based on the second bits, apply a smoothing operation using overlap data that corresponds to a portion of the second frame; and

a second decoder configured to decode an encoded version of the first frame and to generate the overlap data.

32. The apparatus of claim 31, further comprising an antenna coupled to the receiver, wherein the first domain analysis and the second domain analysis comprise a frequency domain analysis and a time domain analysis, respectively, wherein the smoothing operation includes a crossfade operation, and wherein the antenna, the receiver, the first decoder, and the second decoder are integrated into a mobile communication device.

33. A computer-readable storage device storing instructions that, when executed by a processor, cause the processor to perform operations for audio signal encoding, the operations comprising:

encoding a first frame of an audio signal using a first domain analysis at a first encoder;

generating, during encoding of the first frame, a baseband signal corresponding to a high band estimate of the audio signal or to a synthesized version of at least a portion of the audio signal; and

encoding a second frame of the audio signal using a second domain analysis at a second encoder, wherein encoding the second frame includes processing first data representative of the baseband signal and second data representative of a high

band portion of the second frame to generate high band parameters associated with the second frame.

34. The computer-readable storage device of claim 33, wherein the first encoder comprises a transform-based encoder, and wherein the second encoder comprises a linear prediction (LP)-based encoder.

35. The computer-readable storage device of claim 33, wherein the baseband signal is generated by performing a flip operation and a decimation operation, and wherein the operations further comprise populating a first portion of a target signal buffer of the second encoder based at least partially on the first data and populating a second portion of the target signal buffer based at least partially on the second data.

36. The computer-readable storage device of claim 33, wherein the baseband signal is generated using a local decoder of the first encoder.

37. An apparatus for audio signal encoding, the apparatus comprising:

first means for encoding a first frame of an audio signal based on a first domain analysis, the first means for encoding configured to generate, during encoding of the first frame, a baseband signal corresponding to a high band estimate of the audio signal or to a synthesized version of at least a portion of the audio signal;

second means for encoding, based on a second domain analysis, a second frame of the audio signal based on processing first data representative of the baseband signal and second data representative of a high band portion of the second frame to generate high band parameters associated with the second frame; and

means for transmitting an encoded audio signal associated with the audio signal.

38. The apparatus of claim 37, wherein the first domain analysis and the second domain analysis comprise a frequency domain analysis and a time domain analysis, respectively, and wherein the first means for encoding, the second means for encoding, and the means for transmitting are integrated into at least one of a mobile communication device, a smartphone, a cellular phone, a laptop computer, a computer, a tablet computer, a personal digital assistant, a display device, a television, a gaming console, a music player, a radio, a digital video player, an optical disc player, a tuner, a camera, a navigation device, a decoder system, or an encoder system.

39. The apparatus of claim 37, wherein the first means for encoding is further configured to generate the baseband signal by performing a flip operation and a decimation operation, and

wherein the second means for encoding is configured to store the first data and the second data in a target signal buffer.

40. The apparatus of claim 37, wherein the first means for encoding is further configured to generate the baseband signal using a local decoder.