CLAIMS:

1. A method performed by at least one processor, the method comprising:

encoding a first sub-picture of a picture, independently from a second sub-picture of the picture, using sub-picture, tile group, and tile partitioning; and

sending, to at least one decoder, at least one coded sub-bitstream of a coded video stream that includes the first sub-picture and the second sub-picture, wherein

(i) the first sub-picture is a first rectangular region of the picture and the second sub-picture is a second rectangular region of the picture, the second rectangular region being different from the first rectangular region,

(ii) the first sub-picture includes a first plurality of tiles, and the second sub-picture includes at least one tile,

(iii) the first sub-picture and the second sub-picture do not share a common tile,

(iv) the first plurality of tiles of the first sub-picture are grouped into at least two first tile groups, and

(v) the first sub-picture is encoded in accordance with a coding technology, wherein loop filtering control at a boundary between the at least two first tile groups is only allowed where each of the at least two first tile groups is rectangular.

2. The method of claim 1, further comprising:

encoding the second sub-picture of the picture, independently from the first sub-picture, using the sub-picture, tile group, and tile partitioning, wherein

the at least one tile of the second sub-picture is a second plurality of tiles.

3. The method of claim 2, wherein

the encoding of the first sub-picture is performed with a different tile scan order than the encoding of the second sub-picture.

4. The method of claim 2, wherein

the encoding of the first sub-picture and the encoding of the second sub-picture is performed using the sub-picture, tile group, and tile partitioning, wherein:

the second plurality of tiles of the second sub-picture are grouped into at least one second tile group, and

no tiles of the at least two first tile groups are located in the at least one second tile group.

5. The method of claim 4, wherein one of the at least two first tile groups is a non-rectangular tile group.

6. The method of claim 1, wherein the sending the at least one coded sub-bitstream comprises sending a flag that indicates whether in-loop filtering operations is performed across tile group boundaries.

7. The method of claim 1, wherein

the sending the at least one coded sub-bitstream includes sending the coded video stream, the coded video stream including a sequence parameter set (SPS) that includes information on how to partition sub-pictures of the picture, including the first sub-picture and the second sub-picture with their respective identifiers.

8. The method of claim 7, wherein

the coded video stream includes a picture parameter set (PPS) that includes information on how to partition, arrange, or relocate tiles of the picture, including the at least one tile of the first sub-picture and the at least one tile of the second-sub picture.

9. The method of claim 8, wherein

the coded video stream includes an active parameter set (APS) that signals adaptive loop filter (ALF) coefficients of the first sub-picture.

10. An encoder for encoding a video stream, the video stream including a coded version of a first sub-picture and a second sub-picture of a picture, the encoder comprising:

memory configured to store computer program code; and

at least one processor configured to access the computer program code, and operate as instructed by the computer program code, the computer program code including:

encoding code configured to cause the at least one processor to encode the first sub-picture of the picture, independently from the second sub-picture, using sub-picture, tile group, and tile partitioning; and

sending code configured to cause the at least one processor to send, to at least one decoder, at least one coded sub-bitstream of a coded video stream that includes the first sub-picture and the second sub-picture, wherein

(i) the first sub-picture is a first rectangular region of the picture and the second sub-picture is a second rectangular region of the picture, the second rectangular region being different from the first rectangular region,

(ii) the first sub-picture includes a first plurality of tiles, and the second sub-picture each includes at least one tile,

(iii) the first sub-picture and the second sub-picture do not share a common tile,

(iv) the first plurality of tiles of the first sub-picture are grouped into at least two first tile groups, and

(v) the first sub-picture is encoded in accordance with a coding technology wherein loop filtering control at a boundary between the at least two first tile groups is only allowed where each of the at least two first tile groups is rectangular.

11. The encoder of claim 10, wherein

the encoding code is further configured to cause the at least one processor to encode the second sub-picture of the picture, independently from the first sub-picture, using the sub-picture, tile group, and tile partitioning, and

the at least one tile of the second sub-picture is a second plurality of tiles.

12. The encoder of claim 11, wherein

the encoding code is configured to cause the at least one processor to encode the first sub-picture with a different tile scan order than a tile scan order used to encode the second sub-picture.

13. The encoder of claim 11, wherein

the encoding code is configured to cause the at least one processor to encode the first sub-picture and the second sub-picture using the sub-picture, tile group, and tile partitioning, wherein:

the second plurality of tiles of the second sub-picture are grouped into at least one second tile group, and

no tiles of the at least two first tile groups are located in the at least one second tile group.

14. The encoder of claim 13, wherein one of the at least two first tile groups is a non-rectangular tile group.

15. The encoder of claim 10, wherein the sending code is further configured to cause the at least one processor to send a flag that indicates whether in-loop filtering operations is performed across tile group boundaries.

16. The encoder of claim 10, wherein

the encoder is configured to send the coded video stream that includes the at least one coded sub-bitstream, the coded video stream including a sequence parameter set (SPS) that includes first information on how to partition sub-pictures of the picture, including the first sub-picture and the second sub-picture with their respective identifiers.

17. The encoder of claim 16, wherein

the coded video stream includes a picture parameter set (PPS) that includes second information on how to partition, arrange, or relocate tiles of the picture, including the at least one tile of the first sub-picture and the at least one tile of the second sub-picture.

18. The encoder of claim 17, wherein the sending code is configured to cause the at least one processor to send

the coded video stream includes an active parameter set (APS) that signals adaptive loop filter (ALF) coefficients of the first sub-picture.

19. A non-transitory computer-readable medium storing computer instructions that, when executed by at least one processor, cause the at least one processor to:

encode a first sub-picture of a picture, independently from a second sub-picture of the picture, using sub-picture, tile group, and tile partitioning; and

send, to at least one decoder, at least one coded sub-bitstream of a coded video stream that includes the first sub-picture and the second sub-picture, wherein

(i) the first sub-picture is a first rectangular region of the picture and the second sub-picture is a second rectangular region of the picture, the second rectangular region being different from the first rectangular region,

(ii) the first sub-picture includes a first plurality of tiles, and the second sub-picture includes at least one tile,

(iii) the first sub-picture and the second sub-picture do not share a common tile,

(iv) the first plurality of tiles of the first sub-picture are grouped into at least two first tile groups, and

(v) the first sub-picture is encoded in accordance with a coding technology wherein loop filtering control at a boundary between the at least two first tile groups is only allowed where each of the at least two first tile groups is rectangular.

20. A non-transitory computer-readable recording medium storing a bitstream, wherein the bitstream is generated by the method according to any one of claims 1 to 9.