CLAIMS

1. A method for processing video data, comprising:

performing a conversion between a video comprising a video picture that includes one or more subpictures and a bitstream of the video;

wherein the bitstream conforms to a format rule;

wherein the format rule specifies that a first syntax element is selectively present in a sequence parameter set of the bitstream based on a number of subpictures in the video picture; and

wherein the first syntax element indicates whether an in-loop filtering operation is allowed to be performed across subpicture boundaries in a coded layer video sequence (CLVS) and whether all subpicture boundaries in the CLVS are treated as picture boundaries.

2. The method of claim 1, wherein the format rule specifies that in case the number of the subpictures in the video picture is 1, the first syntax element is not present in the sequence parameter set, and a value of the first syntax element is inferred to be equal to 1, and

wherein in case the value of the first syntax element is inferred to be equal to 1, all subpicture boundaries in the CLVS are treated as picture boundaries and no in-loop filtering operation is performed across subpicture boundaries.

3. The method of claim 1 or 2, wherein the first syntax element comprises sps_independent_subpics_flag.

4. The method of any one of claims 1-3, wherein the number of subpictures in the video picture is indicated by a second syntax element in the sequence parameter set, which plus 1 specifies the number of subpictures in each video picture in the CLVS.

5. The method of any one of claims 1-4, wherein the format rule further specifies that the number of subpictures in the video picture determines a manner of indicating a third syntax element, which indicates whether a subpicture of each video picture in the CLVS is treated as a picture in the conversion excluding the in-loop filtering operation.

6. The method of claim 5, wherein in case the number of subpictures in the video picture is 1, a value of the third syntax element is inferred to be equal to 1, and

wherein in case the value of the third syntax element is equal to 1, a subpicture of each video picture in the CLVS is treated as a picture in the conversion excluding the in-loop filtering operation.

7. The method of any one of claims 1-6, wherein the format rule further specifies that the number of subpictures in the video picture determines a manner of indicating a fourth syntax element, which indicates whether the in-loop filtering operation is allowed to be performed across subpicture boundaries.

8. The method of claim 7, wherein in case the number of subpictures in the video picture is 1, a value of the fourth syntax element is inferred to be equal to 0, and

wherein in case the value of the fourth syntax element is equal to 0, the in-loop filtering operation across subpicture boundaries is disabled.

9. The method of any one of claims 1-8, wherein the conversion comprises encoding the video into the bitstream.

10. The method of any one of claims 1-8, wherein the conversion comprises decoding the video from the bitstream.

11. An apparatus for processing video data comprising a processor and a non-transitory memory with instructions thereon, wherein the instructions upon execution by the processor, cause the processor to:

perform a conversion between a video comprising a video picture that includes one or more subpictures and a bitstream of the video;

wherein the bitstream conforms to a format rule;

wherein the format rule specifies that a first syntax element is selectively present in a sequence parameter set of the bitstream based on a number of subpictures in the video picture; and

wherein the first syntax element indicates whether an in-loop filtering operation is allowed to be performed across subpicture boundaries in a coded layer video sequence (CLVS) and whether all subpicture boundaries in the CLVS are treated as picture boundaries.

12. The apparatus of claim 11, wherein the format rule specifies that in case the number of the subpictures in the video picture is 1, the first syntax element is not present in the sequence parameter set, and a value of the first syntax element is inferred to be equal to 1, and

wherein in case the value of the first syntax element is inferred to be equal to 1, all subpicture boundaries in the CLVS are treated as picture boundaries and no in-loop filtering operation is performed across subpicture boundaries.

13. The apparatus of claim 11 or 12, wherein the first syntax element comprises sps_independent_subpics_flag.

14. The apparatus of any one of claims 11-13, wherein the number of subpictures in the video picture is indicated by a second syntax element in the sequence parameter set, which plus 1 specifies the number of subpictures in each video picture in the CLVS.

15. The apparatus of any one of claims 11-14, wherein the format rule further specifies that the number of subpictures in the video picture determines a manner of indicating a third syntax element, which indicates whether a subpicture of each video picture in the CLVS is treated as a picture in the conversion excluding the in-loop filtering operation;

wherein in case the number of subpictures in the video picture is 1, a value of the third syntax element is inferred to be equal to 1, and

wherein in case the value of the third syntax element is equal to 1, a subpicture of each video picture in the CLVS is treated as a picture in the conversion excluding the in-loop filtering operation.

16. The apparatus of any one of claims 11-15, wherein the format rule further specifies that the number of subpictures in the video picture determines a manner of indicating a fourth syntax

element, which indicates whether the in-loop filtering operation is allowed to be performed across subpicture boundaries;

wherein in case the number of subpictures in the video picture is 1, a value of the fourth syntax element is inferred to be equal to 0, and

wherein in case the value of the fourth syntax element is equal to 0, the in-loop filtering operation across subpicture boundaries is disabled.

17. A non-transitory computer-readable storage medium storing instructions that cause a processor to:

perform a conversion between a video comprising a video picture that includes one or more subpictures and a bitstream of the video;

wherein the bitstream conforms to a format rule;

wherein the format rule specifies that a first syntax element is selectively present in a sequence parameter set of the bitstream based on a number of subpictures in the video picture; and

wherein the first syntax element indicates whether an in-loop filtering operation is allowed to be performed across subpicture boundaries in a coded layer video sequence (CLVS) and whether all subpicture boundaries in the CLVS are treated as picture boundaries.

18. The non-transitory computer-readable storage medium of claim 17, wherein the format rule specifies that in case the number of the subpictures in the video picture is 1, the first syntax element is not present in the sequence parameter set, and a value of the first syntax element is inferred to be equal to 1, and

wherein in case the value of the first syntax element is inferred to be equal to 1, all subpicture boundaries in the CLVS are treated as picture boundaries and no in-loop filtering operation is performed across subpicture boundaries;

wherein the first syntax element comprises sps_independent_subpics_flag;

wherein the number of subpictures in the video picture is indicated by a second syntax element in the sequence parameter set, which plus 1 specifies the number of subpictures in each video picture in the CLVS;

wherein the format rule further specifies that the number of subpictures in the video picture determines a manner of indicating a third syntax element, which indicates whether a subpicture of

each video picture in the CLVS is treated as a picture in the conversion excluding the in-loop filtering operation;

wherein in case the number of subpictures in the video picture is 1, a value of the third syntax element is inferred to be equal to 1, and

wherein in case the value of the third syntax element is equal to 1, a subpicture of each video picture in the CLVS is treated as a picture in the conversion excluding the in-loop filtering operation;

wherein the format rule further specifies that the number of subpictures in the video picture determines a manner of indicating a fourth syntax element, which indicates whether the in-loop filtering operation is allowed to be performed across subpicture boundaries; and

wherein in case the number of subpictures in the video picture is 1, a value of the fourth syntax element is inferred to be equal to 0, and

wherein in case the value of the fourth syntax element is equal to 0, the in-loop filtering operation across subpicture boundaries is disabled.

19. A non-transitory computer-readable recording medium storing a bitstream of a video which is generated by a method performed by a video processing apparatus, wherein the method comprises:

generating the bitstream of the video comprising a video picture that includes one or more subpictures,

wherein the bitstream conforms to a format rule;

wherein the format rule specifies that a first syntax element is selectively present in a sequence parameter set of the bitstream based on a number of subpictures in the video picture; and

wherein the first syntax element indicates whether an in-loop filtering operation is allowed to be performed across subpicture boundaries in a coded layer video sequence (CLVS) and whether all subpicture boundaries in the CLVS are treated as picture boundaries.

20. The non-transitory computer-readable recording medium of claim 19, wherein the format rule specifies that in case the number of the subpictures in the video picture is 1, the first syntax element is not present in the sequence parameter set, and a value of the first syntax element is inferred to be equal to 1, and

wherein in case the value of the first syntax element is inferred to be equal to 1, all subpicture boundaries in the CLVS are treated as picture boundaries and no in-loop filtering operation is performed across subpicture boundaries;

wherein the first syntax element comprises sps_independent_subpics_flag;

wherein the number of subpictures in the video picture is indicated by a second syntax element in the sequence parameter set, which plus 1 specifies the number of subpictures in each video picture in the CLVS;

wherein the format rule further specifies that the number of subpictures in the video picture determines a manner of indicating a third syntax element, which indicates whether a subpicture of each video picture in the CLVS is treated as a picture in the conversion excluding the in-loop filtering operation;

wherein in case the number of subpictures in the video picture is 1, a value of the third syntax element is inferred to be equal to 1, and

wherein in case the value of the third syntax element is equal to 1, a subpicture of each video picture in the CLVS is treated as a picture in the conversion excluding the in-loop filtering operation;

wherein the format rule further specifies that the number of subpictures in the video picture determines a manner of indicating a fourth syntax element, which indicates whether the in-loop filtering operation is allowed to be performed across subpicture boundaries; and

wherein in case the number of subpictures in the video picture is 1, a value of the fourth syntax element is inferred to be equal to 0, and

wherein in case the value of the fourth syntax element is equal to 0, the in-loop filtering operation across subpicture boundaries is disabled.