CLAIMS

1. A method of processing video data, comprising:

performing a conversion between a video comprising blocks and a bitstream of the video according to a rule,

wherein the rule specifies that a first syntax element indicating whether a usage of quantization parameter (QP) difference values of coding unit (CU) level is enabled is included in a picture parameter set (PPS) and the first syntax element is used to control:

whether a second syntax element that indicates an absolute value of a difference value between a QP value of a current CU and a prediction QP value and/or a third syntax element that indicates a sign of the difference value between the QP value of the current CU and the prediction QP value is present in both of a transform unit syntax and a palette coding syntax,

wherein the rule further specifies that when a first general constraint information syntax element is equal to 1, an adaptive loop filtering (ALF) operation for a chroma component of a video region of the video is disabled, an ALF operation for a luma component of the video region is allowed, and a value of a second enable flag included in a sequence parameter set (SPS), a picture header (PH), or a slice header (SH) indicating whether the ALF operation is enabled or disabled is allowed to be equal to 1, wherein the second enable flag equal to 1 specifies that the ALF operation is allowed to be enabled in a sequence level, a picture level, or a slice level,

wherein the rule further specifies that when the first general constraint information syntax element is equal to 1, a value of a third enable flag included in the SPS indicating whether a cross-component adaptive loop filter (CC-ALF) operation for the video region is enabled or disabled is equal to 0, wherein the third enable flag equal to 0 specifies that the CC-ALF operation is disabled in the sequence level, and

wherein the first general constraint information syntax element equal to 1 specifies an absence of one or more adaptation parameter set (APS) network abstraction layer (NAL) units that include ALF data.

2. The method of claim 1, wherein the rule specifies that the first syntax element indicates (1) whether a fourth syntax element indicating a first maximum splitting related value of CUs in an

intra slice that conveys the second syntax element and the third syntax element and a fifth syntax element indicating a second maximum splitting related value of CUs in an inter slice that conveys the second syntax element and the third syntax element are present in one or more PHs referring to the PPS and (2) whether the second syntax element and the third syntax element are allowed to be present in the transform unit syntax and the palette coding syntax.

3. The method of claim 2,

wherein the rule specifies that when a value of the first syntax element is equal to 1, the fourth syntax element and the fifth syntax element are present in the one or more PHs referring to the PPS, and the second syntax element and the third syntax element are allowed to be present in the transform unit syntax and the palette coding syntax, and

wherein the rule specifies that when the value of the first syntax element is equal to 0, the fourth syntax element and the fifth syntax element are not present in the one or more PHs referring to the PPS, and the second syntax element and the third syntax element are not present in the transform unit syntax and the palette coding syntax.

4. The method of claim 2 or 3, wherein the first syntax element is pps_cu_qp_delta_enabled_flag, the fourth syntax element is ph_cu_qp_delta_subdiv_intra_slice, the fifth syntax element is ph_cu_qp_delta_subdiv_inter_slice, and a PH syntax structure of the one or more PHs is as follows:

picture_header_structure( ) {	**Descriptor**
…	
if(ph_intra_slice_allowed_flag) {	
…	
if(pps_cu_qp_delta_enabled_flag)	
ph_cu_qp_delta_subdiv_intra_slice	ue(v)
…	
if(ph_inter_slice_allowed_flag) {	
…	
if(pps_cu_qp_delta_enabled_flag)	

ph_cu_qp_delta_subdiv_inter_slice	ue(v).
…	

5. The method of any of claims 1-4, wherein the rule specifies that responsive to a value of a sixth syntax element included in the PPS indicating that each subpicture of a video picture referring to the PPS includes one and only one rectangular slice, a value of a seventh syntax element included in the PPS is inferred to be equal to a value of an eighth syntax element included in the SPS, wherein the value of the seventh syntax element plus 1 indicating a number of rectangular slices in each video picture referring to the PPS and the value of the eighth syntax element plus 1 indicating a number of subpictures in each video picture referring to the SPS.

6. The method of any of claims 1-5, wherein the rule specifies that a first set of conformance cropping window offset parameters are excluded from the PPS in response to:

a width of each video picture referring to the PPS in units of luma samples being equal to a maximum width indicated in the SPS in units of luma samples referred to by each video picture, and

a height of each video picture referring to the PPS in units of luma samples being equal to a maximum height indicated in the SPS in units of luma samples.

7. The method of claim 6, wherein the rule specifies that in response to a ninth syntax element specifying whether conformance cropping window offset parameters are present in the PPS being equal to 0, the width of each video picture referring to the PPS is equal to the maximum width indicated in the SPS, and the height of each video picture referring to the PPS is equal to the maximum height indicated in the SPS, and

wherein the first set of conformance cropping window offset parameters are inferred to be equal to a second set of conformance cropping window offset parameters included in the SPS, wherein the second set of conformance cropping window offset parameters include one or more additional syntax elements.

8. The method of any of claims 1-7,

wherein the rule specifies that a ninth syntax element specifying whether conformance cropping window offset parameters are present in the PPS is equal to 0 and present in the PPS in response to:

a width of each video picture referring to the PPS in units of luma samples being equal to a maximum width indicated in the SPS in units of luma samples referred to by each video picture, and

a height of each video picture referring to the PPS in units of luma samples being equal to a maximum height indicated in the SPS in units of luma samples, and

wherein the ninth syntax element equal to 0 specifies that the conformance cropping window offset parameters are not present in the PPS.

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

10. The method of any of claims 1-8, wherein the performing 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 blocks and a bitstream of the video according to a rule,

wherein the rule specifies that a first syntax element indicating whether a usage of quantization parameter (QP) difference values of coding unit (CU) level is enabled is included in a picture parameter set (PPS) and the first syntax element is used to control:

whether a second syntax element that indicates an absolute value of a difference value between a QP value of a current CU and a prediction QP value and/or a third syntax element that indicates a sign of the difference value between the QP value of the current CU and the prediction QP value is present in both of a transform unit syntax and a palette coding syntax,

wherein the rule further specifies that when a first general constraint information syntax element is equal to 1, an adaptive loop filtering (ALF) operation for a chroma component of a video region of the video is disabled, an ALF operation for a luma component of the video region is allowed, and a value of a second enable flag included in a sequence parameter set (SPS), a picture header (PH), or a slice header (SH) indicating whether the ALF operation is enabled or disabled is allowed to be equal to 1, wherein the second enable flag equal to 1 specifies that the ALF operation is allowed to be enabled in a sequence level, a picture level, or a slice level,

wherein the rule further specifies that when the first general constraint information syntax element is equal to 1, a value of a third enable flag included in the SPS indicating whether a cross-component adaptive loop filter (CC-ALF) operation for the video region is enabled or disabled is equal to 0, wherein the third enable flag equal to 0 specifies that the CC-ALF operation is disabled in the sequence level, and

wherein the first general constraint information syntax element equal to 1 specifies an absence of one or more adaptation parameter set (APS) network abstraction layer (NAL) units that include ALF data.

12. The apparatus of claim 11, wherein the rule specifies that the first syntax element indicates (1) whether a fourth syntax element indicating a first maximum splitting related value of CUs in an intra slice that conveys the second syntax element and the third syntax element and a fifth syntax element indicating a second maximum splitting related value of CUs in an inter slice that conveys the second syntax element and the third syntax element are present in one or more PHs referring to the PPS and (2) whether the second syntax element and the third syntax element are allowed to be present in the transform unit syntax and the palette coding syntax;

wherein the rule specifies that when a value of the first syntax element is equal to 1, the fourth syntax element and the fifth syntax element are present in the one or more PHs referring to the PPS, and the second syntax element and the third syntax element are allowed to be present in the transform unit syntax and the palette coding syntax;

wherein the rule specifies that when the value of the first syntax element is equal to 0, the fourth syntax element and the fifth syntax element are not present in the one or more PHs referring to the PPS, and the second syntax element and the third syntax element are not present in the transform unit syntax and the palette coding syntax; and

wherein the first syntax element is pps_cu_qp_delta_enabled_flag, the fourth syntax element is ph_cu_qp_delta_subdiv_intra_slice, the fifth syntax element is ph_cu_qp_delta_subdiv_inter_slice, and a PH syntax structure of the one or more PHs is as follows:

picture_header_structure( ) {	**Descriptor**
…	
if(ph_intra_slice_allowed_flag) {	
…	
if(pps_cu_qp_delta_enabled_flag)	
ph_cu_qp_delta_subdiv_intra_slice	ue(v)
…	
if(ph_inter_slice_allowed_flag) {	
…	
if(pps_cu_qp_delta_enabled_flag)	
ph_cu_qp_delta_subdiv_inter_slice	ue(v).
…	

13. The apparatus of claim 11 or 12, wherein the rule specifies that responsive to a value of a sixth syntax element included in the PPS indicating that each subpicture of a video picture referring to the PPS includes one and only one rectangular slice, a value of a seventh syntax element included in the PPS is inferred to be equal to a value of an eighth syntax element included in the SPS, wherein the value of the seventh syntax element plus 1 indicating a number of rectangular slices in each video picture referring to the PPS and the value of the eighth syntax element plus 1 indicating a number of subpictures in each video picture referring to the SPS.

14. The apparatus of any of claims 11-13, wherein the rule specifies that a first set of conformance cropping window offset parameters are excluded from the PPS in response to: a width of each video picture referring to the PPS in units of luma samples being equal to a maximum width indicated in the SPS in units of luma samples referred to by each video picture, and a height

of each video picture referring to the PPS in units of luma samples being equal to a maximum height indicated in the SPS in units of luma samples;

wherein the rule specifies that in response to a ninth syntax element specifying whether conformance cropping window offset parameters are present in the PPS being equal to 0, the width of each video picture referring to the PPS is equal to the maximum width indicated in the SPS, and the height of each video picture referring to the PPS is equal to the maximum height indicated in the SPS;

wherein the first set of conformance cropping window offset parameters are inferred to be equal to a second set of conformance cropping window offset parameters included in the SPS, wherein the second set of conformance cropping window offset parameters include one or more additional syntax elements;

wherein the rule specifies that the ninth syntax element specifying whether conformance cropping window offset parameters are present in the PPS is equal to 0 and present in the PPS in response to:

the width of each video picture referring to the PPS in units of luma samples being equal to the maximum width indicated in the SPS in units of luma samples referred to by each video picture, and

the height of each video picture referring to the PPS in units of luma samples being equal to the maximum height indicated in the SPS in units of luma samples, and

wherein the ninth syntax element equal to 0 specifies that the conformance cropping window offset parameters are not present in the PPS.

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

perform a conversion between a video comprising blocks and a bitstream of the video according to a rule,

wherein the rule specifies that a first syntax element indicating whether a usage of quantization parameter (QP) difference values of coding unit (CU) level is enabled is included in a picture parameter set (PPS) and the first syntax element is used to control:

whether a second syntax element that indicates an absolute value of a difference value between a QP value of a current CU and a prediction QP value and/or a third syntax

element that indicates a sign of the difference value between the QP value of the current CU and the prediction QP value is present in both of a transform unit syntax and a palette coding syntax,

wherein the rule further specifies that when a first general constraint information syntax element is equal to 1, an adaptive loop filtering (ALF) operation for a chroma component of a video region of the video is disabled, an ALF operation for a luma component of the video region is allowed, and a value of a second enable flag included in a sequence parameter set (SPS), a picture header (PH), or a slice header (SH) indicating whether the ALF operation is enabled or disabled is allowed to be equal to 1, wherein the second enable flag equal to 1 specifies that the ALF operation is allowed to be enabled in a sequence level, a picture level, or a slice level,

wherein the rule further specifies that when the first general constraint information syntax element is equal to 1, a value of a third enable flag included in the SPS indicating whether a cross-component adaptive loop filter (CC-ALF) operation for the video region is enabled or disabled is equal to 0, wherein the third enable flag equal to 0 specifies that the CC-ALF operation is disabled in the sequence level, and

wherein the first general constraint information syntax element equal to 1 specifies an absence of one or more adaptation parameter set (APS) network abstraction layer (NAL) units that include ALF data.

16. The non-transitory computer-readable storage medium of claim 15, wherein the rule specifies that the first syntax element indicates (1) whether a fourth syntax element indicating a first maximum splitting related value of CUs in an intra slice that conveys the second syntax element and the third syntax element and a fifth syntax element indicating a second maximum splitting related value of CUs in an inter slice that conveys the second syntax element and the third syntax element are present in one or more PHs referring to the PPS and (2) whether the second syntax element and the third syntax element are allowed to be present in the transform unit syntax and the palette coding syntax;

wherein the rule specifies that when a value of the first syntax element is equal to 1, the fourth syntax element and the fifth syntax element are present in the one or more PHs referring to the PPS, and the second syntax element and the third syntax element are allowed to be present in the transform unit syntax and the palette coding syntax;

wherein the rule specifies that when the value of the first syntax element is equal to 0, the fourth syntax element and the fifth syntax element are not present in the one or more PHs referring to the PPS, and the second syntax element and the third syntax element are not present in the transform unit syntax and the palette coding syntax; and

wherein the first syntax element is pps_cu_qp_delta_enabled_flag, the fourth syntax element is ph_cu_qp_delta_subdiv_intra_slice, the fifth syntax element is ph_cu_qp_delta_subdiv_inter_slice, and a PH syntax structure of the one or more PHs is as follows:

picture_header_structure( ) {	**Descriptor**
…	
if(ph_intra_slice_allowed_flag) {	
…	
if(pps_cu_qp_delta_enabled_flag)	
ph_cu_qp_delta_subdiv_intra_slice	ue(v)
…	
if(ph_inter_slice_allowed_flag) {	
…	
if(pps_cu_qp_delta_enabled_flag)	
ph_cu_qp_delta_subdiv_inter_slice	ue(v).
…	

17. The non-transitory computer-readable storage medium of claim 15 or 16, wherein the rule specifies that responsive to a value of a sixth syntax element included in the PPS indicating that each subpicture of a video picture referring to the PPS includes one and only one rectangular slice, a value of a seventh syntax element included in the PPS is inferred to be equal to a value of an eighth syntax element included in the SPS, wherein the value of the seventh syntax element plus 1 indicating a number of rectangular slices in each video picture referring to the PPS and the value of the eighth syntax element plus 1 indicating a number of subpictures in each video picture referring to the SPS;

wherein the rule specifies that a first set of conformance cropping window offset parameters are excluded from the PPS in response to: a width of each video picture referring to the PPS in units of luma samples being equal to a maximum width indicated in the SPS in units of luma samples referred to by each video picture, and a height of each video picture referring to the PPS in units of luma samples being equal to a maximum height indicated in the SPS in units of luma samples;

wherein the rule specifies that in response to a ninth syntax element specifying whether conformance cropping window offset parameters are present in the PPS being equal to 0, the width of each video picture referring to the PPS is equal to the maximum width indicated in the SPS, and the height of each video picture referring to the PPS is equal to the maximum height indicated in the SPS;

wherein the first set of conformance cropping window offset parameters are inferred to be equal to a second set of conformance cropping window offset parameters included in the SPS, wherein the second set of conformance cropping window offset parameters include one or more additional syntax elements;

wherein the rule specifies that the ninth syntax element specifying whether conformance cropping window offset parameters are present in the PPS is equal to 0 and present in the PPS in response to:

the width of each video picture referring to the PPS in units of luma samples being equal to the maximum width indicated in the SPS in units of luma samples referred to by each video picture, and

the height of each video picture referring to the PPS in units of luma samples being equal to the maximum height indicated in the SPS in units of luma samples, and

wherein the ninth syntax element equal to 0 specifies that the conformance cropping window offset parameters are not present in the PPS.

18. 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 which comprises blocks according to a rule,

wherein the rule specifies that a first syntax element indicating whether a usage of quantization parameter (QP) difference values of coding unit (CU) level is enabled is included in a picture parameter set (PPS) and the first syntax element is used to control:

whether a second syntax element that indicates an absolute value of a difference value between a QP value of a current CU and a prediction QP value and/or a third syntax element that indicates a sign of the difference value between the QP value of the current CU and the prediction QP value is present in both of a transform unit syntax and a palette coding syntax,

wherein the rule further specifies that when a first general constraint information syntax element is equal to 1, an adaptive loop filtering (ALF) operation for a chroma component of a video region of the video is disabled, an ALF operation for a luma component of the video region is allowed, and a value of a second enable flag included in a sequence parameter set (SPS), a picture header (PH), or a slice header (SH) indicating whether the ALF operation is enabled or disabled is allowed to be equal to 1, wherein the second enable flag equal to 1 specifies that the ALF operation is allowed to be enabled in a sequence level, a picture level, or a slice level,

wherein the rule further specifies that when the first general constraint information syntax element is equal to 1, a value of a third enable flag included in the SPS indicating whether a cross-component adaptive loop filter (CC-ALF) operation for the video region is enabled or disabled is equal to 0, wherein the third enable flag equal to 0 specifies that the CC-ALF operation is disabled in the sequence level, and

wherein the first general constraint information syntax element equal to 1 specifies an absence of one or more adaptation parameter set (APS) network abstraction layer (NAL) units that include ALF data.

19. The non-transitory computer-readable recording medium of claim 18, wherein the rule specifies that the first syntax element indicates (1) whether a fourth syntax element indicating a first maximum splitting related value of CUs in an intra slice that conveys the second syntax element and the third syntax element and a fifth syntax element indicating a second maximum splitting related value of CUs in an inter slice that conveys the second syntax element and the third syntax element are present in one or more PHs referring to the PPS and (2) whether the second

syntax element and the third syntax element are allowed to be present in the transform unit syntax and the palette coding syntax;

wherein the rule specifies that when a value of the first syntax element is equal to 1, the fourth syntax element and the fifth syntax element are present in the one or more PHs referring to the PPS, and the second syntax element and the third syntax element are allowed to be present in the transform unit syntax and the palette coding syntax;

wherein the rule specifies that when the value of the first syntax element is equal to 0, the fourth syntax element and the fifth syntax element are not present in the one or more PHs referring to the PPS, and the second syntax element and the third syntax element are not present in the transform unit syntax and the palette coding syntax; and

wherein the first syntax element is pps_cu_qp_delta_enabled_flag, the fourth syntax element is ph_cu_qp_delta_subdiv_intra_slice, the fifth syntax element is ph_cu_qp_delta_subdiv_inter_slice, and a PH syntax structure of the one or more PHs is as follows:

picture_header_structure( ) {	**Descriptor**
…	
if(ph_intra_slice_allowed_flag) {	
…	
if(pps_cu_qp_delta_enabled_flag)	
ph_cu_qp_delta_subdiv_intra_slice	ue(v)
…	
if(ph_inter_slice_allowed_flag) {	
…	
if(pps_cu_qp_delta_enabled_flag)	
ph_cu_qp_delta_subdiv_inter_slice	ue(v).
…	

20. The non-transitory computer-readable recording medium of claim 18 or 19, wherein the rule specifies that responsive to a value of a sixth syntax element included in the PPS indicating that each subpicture of a video picture referring to the PPS includes one and only one rectangular slice,

a value of a seventh syntax element included in the PPS is inferred to be equal to a value of an eighth syntax element included in the SPS, wherein the value of the seventh syntax element plus 1 indicating a number of rectangular slices in each video picture referring to the PPS and the value of the eighth syntax element plus 1 indicating a number of subpictures in each video picture referring to the SPS;

wherein the rule specifies that a first set of conformance cropping window offset parameters are excluded from the PPS in response to: a width of each video picture referring to the PPS in units of luma samples being equal to a maximum width indicated in the SPS in units of luma samples referred to by each video picture, and a height of each video picture referring to the PPS in units of luma samples being equal to a maximum height indicated in the SPS in units of luma samples;

wherein the rule specifies that in response to a ninth syntax element specifying whether conformance cropping window offset parameters are present in the PPS being equal to 0, the width of each video picture referring to the PPS is equal to the maximum width indicated in the SPS, and the height of each video picture referring to the PPS is equal to the maximum height indicated in the SPS;

wherein the first set of conformance cropping window offset parameters are inferred to be equal to a second set of conformance cropping window offset parameters included in the SPS, wherein the second set of conformance cropping window offset parameters include one or more additional syntax elements;

wherein the rule specifies that the ninth syntax element specifying whether conformance cropping window offset parameters are present in the PPS is equal to 0 and present in the PPS in response to:

the width of each video picture referring to the PPS in units of luma samples being equal to the maximum width indicated in the SPS in units of luma samples referred to by each video picture, and

the height of each video picture referring to the PPS in units of luma samples being equal to the maximum height indicated in the SPS in units of luma samples, and

wherein the ninth syntax element equal to 0 specifies that the conformance cropping window offset parameters are not present in the PPS.