CLAIMS

1. A method of decoding video data, the method comprising: determining an initial quantization parameter (QP) for a luma component; for a coding unit (CU) of the video data encoded with a color space transform enabled, setting a final QP for the luma component such that the final QP for the luma component is equal to a sum of the initial QP of the luma component and a non-zero QP offset for the luma component; inverse quantizing, based on the final QP for the luma component, a coefficient block for the CU, the coefficient block for the CU being based on sample values of the luma component; applying an inverse transform to the coefficient block to produce a residual block; forming a decoded video block by summing the residual block and a predictive block; determining a boundary strength of a luma edge of the decoded video block, wherein the boundary strength of the luma edge is dependent on the final QP for the luma component; and based on the boundary strength of the luma edge not meeting a first threshold, performing a deblocking filtering process on the luma edge.

2. The method of claim 1, wherein the QP offset for the luma component is signaled in one of: a picture parameter set, a sequence parameter set, and a slice header.

3. The method of claim 1, wherein the luma component is a first color component of a plurality of color components, wherein the QP offset is a first QP offset, wherein the QP is a first QP, and wherein the first QP offset for the first QP for the first color component is equal to a second QP offset for a second QP for a second color component and wherein the first QP offset is less than a third QP offset for a third QP for a third color component.

4. The method of claim 1, further comprising: determining an initial QP for a chroma component; setting a final QP for the chroma component such that the final QP for the chroma component is equal to a sum of the initial QP of the chroma component and a non-zero QP offset for the chroma component; and as part of performing the deblocking filter process, determining a boundary strength of a chroma edge of the decoded video block, wherein the boundary strength for the chroma edge is dependent on the final QP for the chroma component.

5. The method of claim 1, wherein the CU is a first CU, the method further comprising: determining a second QP for a luma component of a second CU not encoded with the color space transform enabled; inverse quantizing, based on the second QP for the luma component, a coefficient block of the second CU, the coefficient block of the second CU based on sample values of the luma component; and reconstructing the second CU based on each of the one or more inverse quantized coefficient blocks of the second CU.

6. The method of claim 1, further comprising selecting different QP offsets for the luma component depending on an encoding mode of the CU.

7. The method of claim 6, further comprising determining the QP offset for the luma component such that the QP offset for the luma component is equal to a first value when

the encoding mode of the CU is an intra mode or an intra block copy (BC) mode, and equal to a second value when the encoding mode of the CU is an inter mode, the first value being different from the second value.

8. The method of claim 6, further comprising determining the QP offset for the component such that the QP offset for the luma component is equal to a first value when the encoding mode of the CU is an intra mode, and equal to a second value when the encoding mode of the CU is an intra block copy (BC) mode or an inter mode, the first value being different from the second value.

9. The method of claim 1, wherein the luma component is a first color component of a plurality of color components, wherein the plurality of color components comprises three color components, wherein respective QP offsets are associated with each of the three color components, and wherein the respective QP offsets are equal to (−5+6*BitInc, −5+6*BitInc, −3+6*BitInc), wherein Bitlnc is equal to one of 0, 1, or 2.

10. The method of claim 1, wherein the QP offset for the luma component is dependent on whether a slice type of the CU an I-slice type, a P-slice type, or a B-slice type.

11. The method of claim 10, further comprising: determining the QP offset for the luma component is equal to a first value when the slice type of the CU is the I-slice type and equal to a second value when the slice type of the CU is the P-slice type or the B-slice type, the first value being different from the second value.

12. The method of claim 10, further comprising: determining the QP offset for the luma component is equal to a first value when the slice type of the CU is the I-slice type, equal to a second value when the slice type of the CU is the P-slice type, and equal to a third value when the slice type of the CU is the B-slice type, the first value being different from the second value, the second value being different from the third value, and the first value being different from the third value.

13. The method of claim 1, wherein input data of the color space transform has N-bit precision, and residual data for the CU after intra/inter prediction is in a range of $[-2^N, 2^N-1]$, wherein the residual data includes the residual block, the method further comprising: after performing the color space transform to produce transformed residual data, clipping the transformed residual data such that the transformed residual data is within the range.

14. The method of claim 1, further comprising: determining whether the CU is coded with an intra coding mode and in response to determining that the CU is coded with the intra coding mode: predicting all chroma blocks of the CU using a same chroma prediction mode based on intra-prediction mode indicators; based on the CU having only one prediction unit (PU), predicting all luma blocks of the CU using a same luma prediction mode, wherein the same luma prediction mode is the same as the same chroma prediction mode; and based on the CU having a plurality of PUs, predicting a first luma block of a first PU of the plurality of PUs using the same luma prediction

mode.

15. A device for decoding video data, the device comprising: a memory configured to store the video data; and one or more processors configured to: determine an initial quantization parameter (QP) for a luma component; for a coding unit (CU) of the video data encoded with a color space transform enabled, set a final QP for the luma component such that the final QP for the luma component is equal to a sum of the initial QP of the luma component and a non-zero QP offset for the luma component; inverse quantize, based on the final QP for the luma component, a coefficient block for the CU, the coefficient block for the CU being based on sample values of the luma component; apply an inverse transform to the coefficient block to produce a residual block; form a decoded video block by summing the residual block and a predictive block; determine a boundary strength of a luma edge of the decoded video block, wherein the boundary strength of the luma edge is dependent on the final QP for the luma component; and based on the boundary strength of the luma edge not meeting a first threshold, perform a deblocking filtering process on the luma edge.

16. The device of claim 15, wherein the QP offset for the luma component is signaled in one of: a picture parameter set, a sequence parameter set, and a slice header.

17. The device of claim 15, wherein the luma component is a first color component of a plurality of color components, wherein the QP offset is a first QP offset, wherein the QP is a first QP, and wherein the first QP offset for the first QP for the first color component is equal to a second QP offset for a second QP for a second color component and wherein the first QP offset is less than a third QP offset for a third QP for a third color component.

18. The device of claim 15, wherein the one or more processors are further configured to: determine an initial QP for a chroma component; set a final QP for the chroma component such that the final QP for the chroma component is equal to a sum of the initial QP of the chroma component and a non-zero QP offset for the chroma component; and as part of performing the deblocking filter process, determine a boundary strength of a chroma edge of the decoded video block, wherein the boundary strength for the chroma edge is dependent on the final QP for the chroma component.

19. The device of claim 15, wherein the CU is a first CU, wherein the one or more processors are further configured to: determine a second QP for a luma component of a second CU not encoded with the color space transform enabled; inverse quantize, based on the second QP for the luma component, a coefficient block of the second CU, the coefficient block of the second CU based on sample values of the luma component; and reconstruct the second CU based on each of the one or more inverse quantized coefficient blocks of the second CU.

20. The device of claim 15, wherein the QP offset for the luma component is dependent on an encoding mode of the CU.

21. The device of claim 20, wherein the one or more processors are further configured to determine the QP offset for the luma component such that the QP offset for the luma component is equal to a first value when the encoding mode of the CU is an intra mode or an intra block copy (BC) mode, and equal to a second value when the encoding mode of the CU is an inter mode, the first value being different from the second value.

22. The device of claim 20, wherein the one or more processors are further configured to determine the QP offset for the component such that the QP offset for the luma component is equal to a first value when the encoding mode of the CU is an intra mode, and equal to a second value when the encoding mode of the CU is an intra block copy (BC) mode or an inter mode, the first value being different from the second value.

23. The device of claim 15, wherein the luma component is a first color component of a plurality of color components, wherein the plurality of color components comprises three color components, wherein respective QP offsets are associated with each of the three color components, and wherein the respective QP offsets are equal to (−5+6*BitInc, −5+6*BitInc, −3+6*BitInc), wherein Bitlnc is equal to one of 0, 1, or 2.

24. The device of claim 15, wherein the QP offset for the luma component is dependent on whether a slice type of the CU an I-slice type, a P-slice type, or a B-slice type.

25. The device of claim 24, wherein the one or more processors are further configured to: determine the QP offset for the luma component is equal to a first value when the slice type of the CU is the I-slice type and equal to a second value when the slice type of the CU is the P-slice type or the B-slice type, the first value being different from the second value.

26. The device of claim 24, wherein the one or more processors are further configured to: determine the QP offset for the luma component is equal to a first value when the slice type of the CU is the I-slice type, equal to a second value when the slice type of the CU is the P-slice type, and equal to a third value when the slice type of the CU is the B-slice type, the first value being different from the second value, the second value being different from the third value, and the first value being different from the third value.

27. The device of claim 15, wherein input data of the color space transform has N-bit precision, and residual data for the CU after intra/inter prediction is in a range of $[-2^N, 2^N-1]$, wherein the residual data includes the residual block, wherein the one or more processors are further configured to: after performing the color space transform to produce transformed residual data, clip the transformed residual data such that the transformed residual data is within the range.

28. The device of claim 15, wherein the one or more processors are further configured to: in response to determining the CU is coded with an intra coding mode: predict all chroma blocks of the CU using a same chroma prediction mode; based on the CU having only one prediction unit (PU), predict all luma blocks of the CU using a same luma prediction mode, wherein the same luma prediction mode is the same as the same

chroma prediction mode; and based on the CU having a plurality of PUs, predict a first luma block of a first PU of the plurality of PUs using the same luma prediction mode.

29. The device of claim 15, wherein the device comprises at least one of: an integrated circuit; a microprocessor; or a wireless communication device.

30. The device of claim 15, further comprising a display configured to display decoded pictures of the video data.

31. A device for decoding video data, the device comprising: means for determining an initial quantization parameter (QP) for a luma component; for a coding unit (CU) of the video data encoded with a color space transform enabled, means for setting a final QP for the luma component such that the final QP for the luma component is equal to a sum of the initial QP of the luma component and a non-zero QP offset for the luma component; means for inverse quantizing, based on the final QP for the luma component, a coefficient block for the CU, the coefficient block for the CU being based on sample values of the luma component; means for applying an inverse transform to the coefficient block to produce a residual block; means for forming a decoded video block by summing the residual block and a predictive block; means for determining a boundary strength of a luma edge of the decoded video block, wherein the boundary strength of the luma edge is dependent on the final QP for the luma component; and based on the boundary strength of the luma edge not meeting a first threshold, means for performing a deblocking filtering process on the luma edge.

32. The device of claim 31, wherein the QP offset for the luma component is signaled in one of: a picture parameter set, a sequence parameter set, and a slice header.

33. The device of claim 31, wherein the luma component is a first color component of a plurality of color components, wherein the plurality of color components comprises three color components, wherein respective QP offsets are associated with each of the three color components, and wherein the respective QP offsets are equal to (−5+6*BitInc, −5+6*BitInc, −3+6*BitInc), wherein Bitlnc is equal to one of 0, 1, or 2.

34. The device of claim 31, further comprising: in response to determining the CU is coded with an intra coding mode: means for predicting all chroma blocks of the CU using a same chroma prediction mode; and based on the CU having only one prediction unit (PU), means for predicting all luma blocks of the CU using a same luma prediction mode, wherein the same luma prediction mode is the same as the same chroma prediction mode; and based on the CU having a plurality of PUs, means for predicting a first luma block of a first PU of the plurality of PUs using the same luma prediction mode.

35. A computer-readable storage medium encoded with instructions that, when executed, cause one or more processors to: determine an initial quantization parameter (QP) for a luma component; for a coding unit (CU) of the video data encoded with a color space transform enabled, set a final QP for the luma component such that the final

QP for the luma component is equal to a sum of the initial QP of the luma component and a non-zero QP offset for the luma component; inverse quantize, based on the final QP for the luma component, a coefficient block for the CU, the coefficient block for the CU being based on sample values of the luma component; apply an inverse transform to the coefficient block to produce a residual block; form a decoded video block by summing the residual block and a predictive block; determine a boundary strength of a luma edge of the decoded video block, wherein the boundary strength of the luma edge is dependent on the final QP for the luma component; and based on the boundary strength of the luma edge not meeting a first threshold, perform a deblocking filtering process on the luma edge.

36. The computer-readable storage medium of claim 35, wherein the QP offset for the luma component is signaled in one of: a picture parameter set, a sequence parameter set, and a slice header.

37. The computer-readable storage medium of claim 35, wherein the luma component is a first color component of a plurality of color components, wherein the plurality of color components comprises three color components, wherein respective QP offsets are associated with each of the three color components, and wherein the respective QP offsets are equal to (−5+6*BitInc, −5+6*BitInc, −3+6*BitInc), wherein BitInc is equal to one of 0, 1, or 2.

38. The computer-readable storage medium of claim 35, wherein the instructions further cause the one or more processors to: in response to determining the CU is coded with an intra coding mode: predict all chroma blocks of the CU using a same chroma prediction mode; and based on the CU having only one prediction unit (PU), predicting all luma blocks of the CU using a same luma prediction mode, wherein the same luma prediction mode is the same as the same chroma prediction mode; and based on the CU having a plurality of PUs, predicting a first luma block of a first PU of the plurality of PUs using the same luma prediction mode.

39. A method of encoding video data, the method comprising: determining an initial quantization parameter (QP) for a luma component; for a coding unit (CU) of the video data encoded with a color space transform enabled, setting a final QP for the luma component such that the final QP for the luma component is equal to a sum of the initial QP of the luma component and a non-zero QP offset for the luma component; quantizing, based on the final QP for the luma component, a coefficient block for the CU, the coefficient block for the CU being based on sample values of the luma component; applying a transform to the coefficient block to produce a residual block; determining a boundary strength of a luma edge of the encoded video block, wherein the boundary strength of the luma edge is dependent on the final QP for the luma component; and based on the boundary strength of the luma edge not meeting a first threshold, performing a deblocking filtering process on the luma edge; and encoding the residual block in a video data bitstream.

40. The method of claim 39, wherein the QP offset for the luma component is signaled in one of: a picture parameter set, a sequence parameter set, and a slice header.

41. The method of claim 39, wherein the luma component is a first color component of a plurality of color components, wherein the QP offset is a first QP offset, wherein the QP is a first QP, and wherein the first QP offset for the first QP for the first color component is equal to a second QP offset for a second QP for a second color component and wherein the first QP offset is less than a third QP offset for a third QP for a third color component.

42. The method of claim 39, further comprising: determining an initial QP for a chroma component; setting a final QP for the chroma component such that the final QP for the chroma component is equal to a sum of the initial QP of the chroma component and a non-zero QP offset for the chroma component; and as part of performing the deblocking filter process, determining a boundary strength of a chroma edge of the encoded video block, wherein the boundary strength for the chroma edge is dependent on the final QP for the chroma component.

43. The method of claim 39, wherein the CU is a first CU, the method further comprising: determining a second QP for a luma component of a second CU not encoded with the color space transform enabled; quantizing, based on the second QP for the luma component, a coefficient block of the second CU, the coefficient block of the second CU based on sample values of the luma component; and outputting the video data bitstream comprising a second set of one or more entropy encoded syntax elements representative of each of the quantized second coefficient blocks.

44. The method of claim 39, wherein the QP offset for the luma component is dependent on an encoding mode of the CU.

45. The method of claim 44, further comprising determining the QP offset for the luma component such that the QP offset for the luma component is equal to a first value when the encoding mode of the CU is an intra mode or an intra block copy (BC) mode, and equal to a second value when the encoding mode of the CU is an inter mode, the first value being different from the second value.

46. The method of claim 44, further comprising determining the QP offset for the component such that the QP offset for the luma component is equal to a first value when the encoding mode of the CU is an intra mode, and equal to a second value when the encoding mode of the CU is an intra block copy (BC) mode or an inter mode, the first value being different from the second value.

47. The method of claim 39, wherein the luma component is a first color component of a plurality of color components, wherein the plurality of color components comprises three color components, wherein respective QP offsets are associated with each of the three color components, and wherein the respective QP offsets are equal to (−5+6*BitInc, −5+6*BitInc, −3+6*BitInc), wherein Bitlnc is equal to one of 0, 1, or 2.

48. The method of claim 39, wherein, for the luma component, the QP offset for the color component is dependent on whether a slice type of the CU an I-slice type, a P-slice type, or a B-slice type.

49. The method of claim 39, wherein input data of the color space transform has N-bit precision, and residual data for the CU after intra/inter prediction is in a range of $[-2^N, 2^N-1]$, wherein the residual data includes the residual block, the method further comprising: after performing the color space transform to produce transformed residual data, clipping the transformed residual data such that the transformed residual data is within the range.

50. The method of claim 39, further comprising: in response to determining the CU is coded with an intra coding mode: predicting all chroma blocks of the CU using a same chroma prediction mode; based on the CU having only one prediction unit (PU), predicting all luma blocks of the CU using a same luma prediction mode, wherein the same luma prediction mode is the same as the same chroma prediction mode; and based on the CU having a plurality of PUs, predicting a first luma block of a first PU of the plurality of PUs using the same luma prediction mode.

51. A device for encoding video data, the device comprising: a data storage medium configured to store the video data; and one or more processors configured to: determine an initial quantization parameter (QP) for a luma component; for a coding unit (CU) of the video data encoded with a color space transform enabled, set a final QP for the luma component such that the final QP for the luma component is equal to a sum of the initial QP of the luma component and a non-zero QP offset for the luma component; quantize, based on the final QP for the luma component, a coefficient block for the CU, the coefficient block for the CU being based on sample values of the luma component; apply a transform to the coefficient block to produce a residual block; determining a boundary strength of a luma edge of the encoded video block, wherein the boundary strength of the luma edge is dependent on the final QP for the luma component; and based on the boundary strength of the luma edge not meeting a first threshold, performing a deblocking filtering process on the luma edge; and encode the residual block in a video data bitstream.

52. The device of claim 51, wherein the QP offset for the luma component is signaled in one of: a picture parameter set, a sequence parameter set, and a slice header.

53. The device of claim 51, wherein the luma component is a first color component of a plurality of color components, wherein the QP offset is a first QP offset, wherein the QP is a first QP, and wherein the first QP offset for the first QP for the first color component is equal to a second QP offset for a parameter QP for a second color component and wherein the first QP offset is less than a third QP offset for a third QP for a third color component.

54. The device of claim 51, wherein the one or more processors are further configured

to: determine an initial QP for a chroma component; set a final QP for the chroma component such that the final QP for the chroma component is equal to a sum of the initial QP of the chroma component and a non-zero QP offset for the chroma component; and as part of performing the deblocking filter process, determine a boundary strength of a chroma edge of the encoded video block, wherein the boundary strength for the chroma edge is dependent on the final QP for the chroma component.

55. The device of claim 51, wherein the CU is a first CU, wherein the one or more processors are further configured to: determine a second QP for a luma component of a second CU not encoded with the color space transform enabled; quantize, based on the second QP for the luma component, a coefficient block of the second CU, the coefficient block of the second CU based on sample values of the luma component; and output the video data bitstream comprising a second set of one or more entropy encoded syntax elements representative of each of the quantized second coefficient blocks.

56. The device of claim 51, wherein the QP offset for the luma component is dependent on an encoding mode of the CU.

57. The device of claim 56, wherein the one or more processors are further configured to determine the QP offset for the luma component such that the QP offset for the luma component is equal to a first value when the encoding mode of the CU is an intra mode or an intra block copy (BC) mode, and equal to a second value when the encoding mode of the CU is an inter mode, the first value being different from the second value.

58. The device of claim 56, wherein the one or more processors are further configured to determine the QP offset for the component such that the QP offset for the luma component is equal to a first value when the encoding mode of the CU is an intra mode, and equal to a second value when the encoding mode of the CU is an intra block copy (BC) mode or an inter mode, the first value being different from the second value.

59. The device of claim 51, wherein the luma component is a first color component of a plurality of color components, wherein the plurality of color components comprises three color components, wherein respective QP offsets are associated with each of the three color components, and wherein the respective QP offsets are equal to (−5+6*BitInc, −5+6*BitInc, −3+6*BitInc), wherein Bitlnc is equal to one of 0, 1, or 2.

60. The device of claim 51, wherein the one or more processors are further configured to: determine the QP offset for the luma component is equal to a first value when the slice type of the CU is the I-slice type, equal to a second value when the slice type of the CU is the P-slice type, and equal to a third value when the slice type of the CU is the B-slice type, the first value being different from the second value, the second value being different from the third value, and the first value being different from the third value.

61. The device of claim 51, wherein input data of the color space transform has N-bit precision, and residual data for the CU after intra/inter prediction is in a range of $[-2^N, 2^N-1]$, wherein the residual data includes the residual block, wherein the one or more

processors are further configured to: after performing the color space transform to produce transformed residual data, clip the transformed residual data such that the transformed residual data is within the range.

62. The device of claim 51, wherein the one or more processors are further configured to: in response to determining the CU is coded with an intra coding mode: predict all chroma blocks of the CU using a same chroma prediction mode; based on the CU having only one prediction unit (PU), predict all luma blocks of the CU using a same luma prediction mode, wherein the same luma prediction mode is the same as the same chroma prediction mode; and based on the CU having a plurality of PUs, predict a first luma block of a first PU of the plurality of PUs using the same luma prediction mode.

63. The device of claim 51, wherein the device comprises at least one of: an integrated circuit; a microprocessor; or a wireless communication device.

64. The device of claim 51, further comprising a camera configured to capture the video data.

65. A device for encoding video data, the device comprising: means for determining an initial quantization parameter (QP) for a luma component; for a coding unit (CU) of the video data encoded with a color space transform enabled, means for setting a final QP for the luma component such that the final QP for the luma component is equal to a sum of the initial QP of the luma component and a non-zero QP offset for the luma component; means for quantizing, based on the final QP for the luma component, a coefficient block for the CU, the coefficient block for the CU being based on sample values of the luma component; means for applying a transform to the coefficient block to produce a residual block; means for determining a boundary strength of a luma edge of the encoded video block, wherein the boundary strength of the luma edge is dependent on the final QP for the luma component; and based on the boundary strength of the luma edge not meeting a first threshold, means for performing a deblocking filtering process on the luma edge; and means for encoding the residual block in a video data bitstream.

66. A computer-readable storage medium encoded with instructions that, when executed, cause one or more processors to: determine an initial quantization parameter (QP) for a luma component; for a coding unit (CU) of the video data encoded with a color space transform enabled, set a final QP for the luma component such that the final QP for the luma component is equal to a sum of the initial QP of the luma component and a non-zero QP offset for the luma component; quantize, based on the final QP for the luma component, a coefficient block for the CU, the coefficient block for the CU being based on sample values of the luma component; apply a transform to the coefficient block to produce a residual block; determining a boundary strength of a luma edge of the encoded video block, wherein the boundary strength of the luma edge is dependent on the final QP for the luma component; and based on the boundary strength of the luma edge not meeting a first threshold, performing a deblocking filtering process on the luma edge; and encode the residual block in a video data bitstream.