

WHAT IS CLAIMED IS:

1. A method for video decoding in a decoder, comprising:
 - decoding a first syntax element from a coded video bitstream, the first syntax element indicating whether a first component in the coded video bitstream is coded based on a second component in the coded video bitstream;
 - determining whether to decode one or more second syntax elements for a chroma related coding tool based on the first syntax element, the chroma related coding tool being one of (i) a luma mapping with chroma scaling (LMCS) coding tool and (ii) a cross-component adaptive loop filter (CC-ALF); and
 - decoding the one or more second syntax elements for the chroma related coding tool based on the first syntax element indicating that the first component is coded based on the second component in the coded video bitstream and the first component is a chroma component, wherein
 - the one or more second syntax elements for the chroma related coding tool are not decoded based on the first syntax element indicating that the first component is not coded based on the second component in the coded video bitstream.
2. The method of claim 1, wherein the first syntax element is signaled in an adaptation parameter set (APS).
3. The method of claim 1, wherein the first syntax element indicates at a sequence level whether the first component is coded based on the second component.
4. The method of claim 1, wherein
 - based on the first syntax element indicating that the first component is coded based on the second component, the second component is one of a second chroma component and a luma component in the coded video bitstream; and
 - based on the first syntax element indicating that the first component is not coded based on the second component, (i) the first component is the only component in the coded video bitstream or (ii) the coded video bitstream includes at least the first component and the second component and the first component is not coded based on the second component.
5. The method of claim 4, wherein

the coded video bitstream includes a first chroma component, a second chroma component, and a luma component that have a chroma format of 4:4:4;
the first component is the first chroma component;
the second component is the second chroma component or the luma component; and
the first chroma component, the second chroma component, and the luma component are coded independently from each other.

6. The method of claim 1, further comprising:
disabling the chroma related coding tool based on the first syntax element indicating that the first component is not coded based on the second component in the coded video bitstream.

7. The method of claim 1, wherein the chroma related coding tool is the LMCS coding tool.

8. The method of claim 7, wherein
the one or more second syntax elements for the LMCS coding tool includes a first LMCS parameter indicating an absolute value of a variable for LMCS chroma residual scaling (CRS);
and

the decoding the one or more second syntax elements further includes decoding a second LMCS parameter for the LMCS coding tool based on the absolute value of the variable for the LMCS CRS being larger than 0, the one or more second syntax elements including the second LMCS parameter that indicates a sign of the variable for the LMCS CRS, wherein

the second LMCS parameter for the LMCS coding tool is not decoded based on the absolute value of the variable for the LMCS CRS not being larger than 0.

9. The method of claim 1, wherein the chroma related coding tool is the CC-ALF.

10. The method of claim 9, wherein
the one or more second syntax elements for the CC-ALF includes a first CC-ALF flag and a second CC-ALF flag, the first CC-ALF flag indicating whether a first CC-ALF is signaled in the coded video bitstream, the second CC-ALF flag indicating whether a second CC-ALF is signaled in the coded video bitstream;

the decoding the one or more second syntax elements further includes decoding syntax elements for the first CC-ALF based on the first CC-ALF flag indicating that the first CC-ALF is signaled, the one or more second syntax elements for the CC-ALF including the syntax elements for the first CC-ALF, the syntax elements for the first CC-ALF not being decoded based on the first CC-ALF flag indicating that the first CC-ALF is not signaled; and

the decoding the one or more second syntax elements further includes decoding syntax elements for the second CC-ALF based on the second CC-ALF flag indicating that the second CC-ALF is signaled, the one or more second syntax elements for the CC-ALF including the syntax elements for the second CC-ALF, the syntax elements for the second CC-ALF not being decoded based on the second CC-ALF flag indicating that the second CC-ALF is not signaled.

11. An apparatus for video decoding, comprising processing circuitry configured to:
decode a first syntax element from a coded video bitstream, the first syntax element indicating whether a first component in the coded video bitstream is coded based on a second component in the coded video bitstream;

determine whether to decode one or more second syntax elements for a chroma related coding tool based on the first syntax element, the chroma related coding tool being one of (i) a luma mapping with chroma scaling (LMCS) coding tool and (ii) a cross-component adaptive loop filter (CC-ALF); and

decode the one or more second syntax elements for the chroma related coding tool based on the first syntax element indicating that the first component is coded based on the second component in the coded video bitstream and the first component is a chroma component, wherein

the one or more second syntax elements for the chroma related coding tool are not decoded based on the first syntax element indicating that the first component is not coded based on the second component in the coded video bitstream.

12. The apparatus of claim 11, wherein the first syntax element is signaled in an adaptation parameter set (APS).

13. The apparatus of claim 11, wherein the first syntax element indicates at a sequence level whether the first component is coded based on the second component.

14. The apparatus of claim 11, wherein:

based on the first syntax element indicating that the first component is coded based on the second component, the second component is one of a second chroma component and a luma component in the coded video bitstream; and

based on the first syntax element indicating that the first component is not coded based on the second component, (i) the first component is the only component in the coded video bitstream or (ii) the coded video bitstream includes at least the first component and the second component and the first component is not coded based on the second component.

15. The apparatus of claim 14, wherein

the coded video bitstream includes a first chroma component, a second chroma component, and a luma component that have a chroma format of 4:4:4;

the first component is the first chroma component;

the second component is the second chroma component or the luma component; and

the first chroma component, the second chroma component, and the luma component are coded independently from each other.

16. The apparatus of claim 11, wherein the processing circuitry is configured to:

disable the chroma related coding tool based on the first syntax element indicating that the first component is not coded based on the second component in the coded video bitstream.

17. The apparatus of claim 11, wherein the chroma related coding tool is the LMCS coding tool.

18. The apparatus of claim 17, wherein

the one or more second syntax elements for the LMCS coding tool includes a first LMCS parameter indicating an absolute value of a variable for LMCS chroma residual scaling (CRS); and

the processing circuitry is configured to decode a second LMCS parameter for the LMCS coding tool based on the absolute value of the variable for the LMCS CRS being larger than 0, the one or more second syntax elements including the second LMCS parameter that indicates a sign of the variable for the LMCS CRS, wherein

the second LMCS parameter for the LMCS coding tool is not decoded based on the absolute value of the variable for the LMCS CRS not being larger than 0.

19. The apparatus of claim 11, wherein the chroma related coding tool is the CC-ALF.

20. The apparatus of claim 19, wherein

the one or more second syntax elements for the CC-ALF includes a first CC-ALF flag and a second CC-ALF flag, the first CC-ALF flag indicating whether a first CC-ALF is signaled in the coded video bitstream, the second CC-ALF flag indicating whether a second CC-ALF is signaled in the coded video bitstream;

the processing circuitry is further configured to decode syntax elements for the first CC-ALF based on the first CC-ALF flag indicating that the first CC-ALF is signaled, the one or more second syntax elements for the CC-ALF including the syntax elements for the first CC-ALF, the syntax elements for the first CC-ALF not being decoded based on the first CC-ALF flag indicating that the first CC-ALF is not signaled; and

the processing circuitry is further configured to decode syntax elements for the second CC-ALF based on the second CC-ALF flag indicating that the second CC-ALF is signaled, the one or more second syntax elements for the CC-ALF including the syntax elements for the second CC-ALF, the syntax elements for the second CC-ALF not being decoded based on the second CC-ALF flag indicating that the second CC-ALF is not signaled.