

CLAIMS

What is claimed is:

1. A method implemented in a decoder, the method comprising:
receiving, by a receiver of the decoder, a bitstream comprising an adaptive loop filter (ALF) adaptation parameter set (APS) including an ALF luma filter signal flag (alf_luma_filter_signal_flag) and a ALF chroma filter signal flag (alf_chroma_filter_signal_flag), wherein at least one of the alf_luma_filter_signal_flag or the alf_chroma_filter_signal_flag is equal to one; and
decoding, by a processor of the decoder, a slice based on ALF parameters in the ALF APS.
2. The method of claim 1, wherein the alf_luma_filter_signal_flag specifies whether a luma filter set is signaled in the ALF APS.
3. The method of any of claims 1-2, wherein a value of the alf_luma_filter_signal_flag of the ALF APS is constrained to be equal to one when a luma component ALF APS identifier (ID) in a slice header (slice_alf_aps_id_luma[i]) associated with the slice is equal to an APS ID of the ALF APS.
4. The method of any of claims 1-3, wherein the slice_alf_aps_id_luma[i] specifies an APS ID (adaptation_parameter_set_id) of an i-th ALF APS referred to by a luma component of the slice.
5. The method of any of claims 1-4, wherein the alf_chroma_filter_signal_flag specifies whether a chroma filter set is signaled in the ALF APS.
6. The method of any of claims 1-5, wherein a value of the alf_chroma_filter_signal_flag of the ALF APS is constrained to be equal to one when a chroma component ALF APS ID in a slice header associated with the slice (slice_alf_aps_id_chroma) is equal to the APS ID of the ALF APS.
7. The method of any of claims 1-6, wherein the slice_alf_aps_id_chroma specifies an adaptation_parameter_set_id of the ALF APS referred to by a chroma component of the slice.

8. A method implemented in an encoder, the method comprising:
- encoding, by a processor of the encoder, a slice into a bitstream as part of an encoded video sequence;
 - determining, by the processor, adaptive loop filter (ALF) parameters for application to the slice;
 - encoding, by the processor, the ALF parameters into an ALF adaptation parameter set (APS) in the bitstream, the ALF APS including an ALF luma filter signal flag (alf_luma_filter_signal_flag) and a ALF chroma filter signal flag(alf_chroma_filter_signal_flag), wherein at least one of the alf_luma_filter_signal_flag or the alf_chroma_filter_signal_flag is equal to one; and
 - storing, by a memory coupled to the processor, the bitstream for communication toward a decoder.
9. The method of claim 8, wherein the alf_luma_filter_signal_flag specifies whether a luma filter set is signaled in the ALF APS.
10. The method of any of claims 8-9, wherein a value of the alf_luma_filter_signal_flag of the ALF APS is constrained to be equal to one when a luma component ALF APS identifier (ID) in a slice header (slice_alf_aps_id_luma[i]) associated with the slice is equal to an APS ID of the ALF APS.
11. The method of any of claims 8-10, wherein the slice_alf_aps_id_luma[i] specifies an APS ID (adaptation_parameter_set_id) of an i-th ALF APS referred to by a luma component of the slice.
12. The method of any of claims 8-11, wherein the alf_chroma_filter_signal_flag specifies whether a chroma filter set is signaled in the ALF APS.
13. The method of any of claims 8-12, wherein a value of the alf_chroma_filter_signal_flag of the ALF APS is constrained to be equal to one when a chroma component ALF APS ID in a slice header associated with the slice (slice_alf_aps_id_chroma) is equal to the APS ID of the ALF APS.

14. The method of any of claims 8-13, wherein the slice_alf_aps_id_chroma specifies an adaptation_parameter_set_id of the ALF APS referred to by a chroma component of the slice.
15. A video coding device comprising:
a processor, a receiver coupled to the processor, a memory coupled to the processor, and a transmitter coupled to the processor, wherein the processor, receiver, memory, and transmitter are configured to perform the method of any of claims 1-14.
16. A non-transitory computer readable medium comprising a computer program product for use by a video coding device, the computer program product comprising computer executable instructions stored on the non-transitory computer readable medium such that when executed by a processor cause the video coding device to perform the method of any of claims 1-14.
17. A decoder comprising:
a receiving means for receiving a bitstream comprising an adaptive loop filter (ALF) adaptation parameter set (APS) including an ALF luma filter signal flag (alf_luma_filter_signal_flag) and a ALF chroma filter signal flag (alf_chroma_filter_signal_flag), wherein at least one of the alf_luma_filter_signal_flag or the alf_chroma_filter_signal_flag is equal to one;
a decoding means for decoding a slice based on ALF parameters in the ALF APS; and
a forwarding means for forwarding the slice for display as part of a decoded video sequence.
18. The decoder of claim 17, wherein the decoder is further configured to perform the method of any of claims 1-7.
19. An encoder comprising:
a slice encoding means for encoding a slice into a bitstream as part of an encoded video sequence;
a determining means for determining adaptive loop filter (ALF) parameters for application to the slice;
an ALF encoding means for encoding the ALF parameters into an a ALF adaptation parameter set (APS) in the bitstream, the ALF APS including an ALF luma filter signal flag

(alf_luma_filter_signal_flag) and a ALF chroma filter signal flag(alf_chroma_filter_signal_flag), wherein at least one of the alf_luma_filter_signal_flag or the alf_chroma_filter_signal_flag is equal to one; and

a storing means for storing the bitstream for communication toward a decoder.

20. The encoder of claim 19, wherein the encoder is further configured to perform the method of any of claims 8-14.