NON-CE5: CONSISTENT DEBLOCKING FOR CHROMA COMPONENTS

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Chroma debloking

- HEVC
  - *Cb/Cr follows Y*
  - *Same decision/filter for Cb/Cr*
- VTM5.0
  - *Deblocking for Cb/Cr are independent*
  - *Not friendly to SIMD implementation*
    - Half throughput compared with HEVC



Cb/Cr interleaved

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Unification between Cb and Cr

- BS = 1
  - *If Cb is with cbf=1 or Cr is with cbf=1*
- Long filter/short filter
  - *If one component uses short filter, applying short filter to both components*

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Experimental results (vs. VTM-5.0)

	All Intra Over vtm5.0				
	Y	U	V	EncT	DecT
Class A1	0.00%	0.01%	-0.03%	99%	100%
Class A2	0.00%	-0.14%	-0.04%	100%	99%
Class B	0.00%	-0.07%	-0.13%	99%	97%
Class C	0.00%	-0.02%	-0.03%	100%	101%
Class E	0.00%	-0.05%	-0.01%	101%	98%
Overall	0.00%	-0.05%	-0.06%	100%	99%
Class D	0.00%	-0.01%	-0.05%	102%	99%
Class F	0.00%	-0.01%	0.00%	102%	100%

	All Intra Over vtm5.0 w/ ALF off				
	Y	U	V	EncT	DecT
Class A1	0.00%	0.32%	0.02%	100%	98%
Class A2	0.00%	-0.09%	-0.04%	101%	100%
Class B	0.00%	-0.04%	-0.09%	100%	99%
Class C	0.00%	-0.01%	-0.01%	100%	102%
Class E	0.00%	-0.02%	0.07%	99%	103%
Overall	0.00%	0.02%	-0.02%	100%	100%
Class D	0.00%	0.00%	-0.02%	99%	104%
Class F	0.00%	0.00%	0.02%	101%	100%

	Random Access Over vtm5.0				
	Y	U	V	EncT	DecT
Class A1	0.01%	-0.30%	0.02%	99%	100%
Class A2	0.00%	-0.05%	0.05%	100%	101%
Class B	0.01%	-0.05%	-0.23%	100%	100%
Class C	-0.02%	-0.15%	-0.02%	100%	99%
Class E					
Overall	0.00%	-0.13%	-0.07%	100%	100%
Class D	-0.05%	0.08%	0.25%	100%	101%
Class F	0.02%	0.05%	0.09%	101%	99%

	Random Access Over vtm5.0 w/ ALF off				
	Y	U	V	EncT	DecT
Class A1	-0.02%	0.12%	-0.13%	100%	100%
Class A2	-0.01%	-0.06%	0.06%	101%	100%
Class B	0.01%	-0.05%	-0.17%	101%	100%
Class C	-0.01%	0.10%	0.03%	100%	100%
Class E					
Overall	0.00%	0.02%	-0.06%	100%	100%
Class D	-0.04%	0.25%	0.02%	100%	104%
Class F	-0.02%	0.04%	0.03%	100%	100%

	Low delay B Over vtm5.0				
	Y	U	V	EncT	DecT
Class A1					
Class A2					
Class B	-0.22%	-0.19%	-0.37%	101%	93%
Class C	0.01%	-0.04%	-0.02%	99%	94%
Class E	0.03%	-0.03%	-0.86%	102%	91%
Overall	-0.08%	-0.10%	-0.37%	101%	93%
Class D	0.04%	-0.58%	1.00%	101%	100%
Class F	0.07%	0.22%	0.75%	103%	99%

	Low delay B Over vtm5.0 w/ ALF off				
	Y	U	V	EncT	DecT
Class A1					
Class A2					
Class B	0.03%	-0.01%	-0.15%	100%	100%
Class C	0.00%	-0.04%	0.05%	101%	98%
Class E	0.05%	-0.15%	-0.66%	101%	99%
Overall	0.02%	-0.06%	-0.21%	100%	99%
Class D	0.04%	0.45%	0.40%	101%	99%
Class F	-0.05%	0.47%	0.70%	100%	99%

ALF off

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Conclusions

- Consistent Cb/Cr deblocking for SIMD
  - *Marginal BD-rate changes*
  - *No obvious visual degradation observed*

- Thanks to Sony for cross-checking

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