

Non-RCE4: Combination of Palette Coding Improvements

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Rext5.1 + JCTVC-00218 + Improvements

- Rext5.1 + JCTVC-00218
 - + JCTVC-P0113: Adaptation of run coding
 - + JCTVC-P0114: Palette prediction
 - + JCTVC-P0115: Transition mode
 - + JCTVC-P0116: simplification of coding mode
 - + JCTVC-P0117: Run value coded in level
 - + Max elements equal to 32 (as RCE4 Test 2)
 - + Encoding choices

Experiments results: vs Rext 5.1

- Anchor: Rext 5.1
- Test: proposal

■ Results AI/RA/LB:

● SC:

18.6%/15.9%/13.0%

● OSC:

39% / 31% / 28%

	All Intra Main-tier			All Intra High-tier			All Intra Super-High-tier		
	Y	U	V	Y	U	V	Y	U	V
Class F	-1.6%	-3.7%	-2.7%	-1.3%	-2.4%	-2.0%	-1.1%	-1.5%	-1.3%
Class B	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RGB 4:4:4 SC	-18.7%	-16.7%	-17.2%	-19.7%	-18.8%	-18.9%	-21.4%	-21.6%	-21.6%
RGB 4:4:4 Animation	0.0%	-0.1%	-0.1%	0.0%	-0.1%	-0.1%	0.0%	-0.1%	-0.1%
YCbCr 4:4:4 SC	-13.6%	-18.4%	-20.3%	-17.9%	-20.9%	-22.1%	-20.5%	-23.1%	-24.4%
YCbCr 4:4:4 Animation	0.1%	-0.3%	-0.2%	0.1%	-0.2%	-0.2%	0.0%	-0.2%	-0.1%
RangeExt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RGB 4:4:4 SC (Optional)	-37.0%	-35.9%	-37.0%	-40.5%	-40.0%	-40.9%	-45.8%	-46.1%	-47.2%
YCbCr 4:4:4 SC (Optional)	-29.8%	-35.2%	-34.1%	-36.9%	-40.4%	-39.8%	-43.8%	-48.6%	-49.2%
Enc Time[%]	117.0%			118.2%			120.2%		
Dec Time[%]	100.1%			98.3%			96.6%		

	Random Access Main-tier			Random Access High-tier		
	Y	U	V	Y	U	V
Class F	-0.7%	-4.2%	-2.2%	-0.5%	-2.4%	-1.5%
Class B	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%
RGB 4:4:4 SC	-17.2%	-14.9%	-15.5%	-18.5%	-17.4%	-17.8%
RGB 4:4:4 Animation	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%
YCbCr 4:4:4 SC	-11.7%	-16.2%	-18.8%	-16.1%	-19.5%	-21.3%
YCbCr 4:4:4 Animation	0.1%	-0.4%	-0.3%	0.1%	-0.3%	-0.2%
RangeExt	0.1%	0.2%	0.1%	0.0%	0.1%	0.1%
RGB 4:4:4 SC (Optional)	-30.4%	-29.3%	-30.1%	-34.4%	-33.7%	-34.3%
YCbCr 4:4:4 SC (Optional)	-25.8%	-32.9%	-32.7%	-31.3%	-36.0%	-36.6%
Enc Time[%]	109.9%			110.1%		
Dec Time[%]	110.5%			110.2%		

	Low delay B Main-tier			Low delay B High-tier		
	Y	U	V	Y	U	V
Class F	-0.1%	-3.8%	-1.1%	-0.1%	-1.9%	-0.6%
Class B	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%
RGB 4:4:4 SC	-14.5%	-12.9%	-13.5%	-15.9%	-14.9%	-15.4%
RGB 4:4:4 Animation	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
YCbCr 4:4:4 SC	-9.1%	-13.1%	-15.6%	-12.6%	-15.4%	-17.0%
YCbCr 4:4:4 Animation	0.2%	0.0%	0.0%	0.1%	0.0%	-0.1%
RangeExt	0.2%	0.2%	0.1%	0.1%	0.1%	0.0%
RGB 4:4:4 SC (Optional)	-25.2%	-24.8%	-25.2%	-31.2%	-30.6%	-31.7%
YCbCr 4:4:4 SC (Optional)	-24.4%	-28.7%	-29.0%	-29.0%	-32.4%	-32.7%
Enc Time[%]	108.5%			109.0%		
Dec Time[%]	114.7%			115.1%		

Experiments results: vs RCE4 Test 2

- Anchor: RCE4 Test 2
- Test: proposal

■ Results AI/RA/LB:

● SC:

7.7%/7.7%/9.4%

● OSC:

12% / 12% / 18%

	All Intra Main-tier			All Intra High-tier			All Intra Super-High-tier		
	Y	U	V	Y	U	V	Y	U	V
Class F	-1.0%	-2.0%	-1.7%	-0.2%	-0.7%	-0.7%	0.2%	0.2%	0.2%
Class B	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RGB 4:4:4 SC	-9.8%	-7.9%	-8.2%	-7.7%	-7.0%	-7.0%	-6.1%	-5.5%	-5.7%
RGB 4:4:4 Animation	0.0%	-0.1%	-0.1%	0.0%	-0.1%	-0.1%	0.0%	-0.1%	-0.1%
YCbCr 4:4:4 SC	-7.6%	-10.2%	-11.4%	-7.9%	-9.6%	-10.6%	-7.0%	-8.0%	-8.6%
YCbCr 4:4:4 Animation	0.0%	-0.3%	-0.2%	0.0%	-0.3%	-0.2%	0.0%	-0.2%	-0.1%
RangeExt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RGB 4:4:4 SC (Optional)	-13.0%	-12.9%	-13.1%	-13.4%	-13.2%	-13.4%	-14.0%	-13.8%	-13.9%
YCbCr 4:4:4 SC (Optional)	-10.2%	-9.7%	-9.1%	-10.4%	-10.0%	-9.7%	-10.5%	-9.6%	-9.8%
Enc Time[%]	100.8%			103.0%			105.7%		
Dec Time[%]	95.5%			95.1%			95.3%		

	Random Access Main-tier			Random Access High-tier		
	Y	U	V	Y	U	V
Class F	-0.4%	-1.8%	-1.3%	0.0%	-0.6%	-0.5%
Class B	-0.1%	0.1%	-0.1%	0.0%	0.1%	0.0%
RGB 4:4:4 SC	-9.2%	-7.0%	-7.3%	-8.2%	-7.1%	-7.3%
RGB 4:4:4 Animation	0.1%	-0.1%	0.0%	0.1%	-0.1%	0.0%
YCbCr 4:4:4 SC	-6.1%	-8.5%	-10.2%	-7.3%	-9.4%	-10.9%
YCbCr 4:4:4 Animation	0.0%	-0.4%	-0.3%	0.0%	-0.3%	-0.2%
RangeExt	0.0%	0.1%	0.0%	0.0%	0.1%	0.1%
RGB 4:4:4 SC (Optional)	-12.2%	-12.0%	-12.2%	-13.9%	-13.7%	-13.8%
YCbCr 4:4:4 SC (Optional)	-9.0%	-7.1%	-6.4%	-10.5%	-9.0%	-9.0%
Enc Time[%]	98.8%			100.0%		
Dec Time[%]	98.2%			98.9%		

	Low delay B Main-tier			Low delay B High-tier		
	Y	U	V	Y	U	V
Class F	-0.1%	-1.5%	-0.5%	0.1%	-0.4%	-0.1%
Class B	0.0%	0.3%	0.4%	0.0%	0.2%	0.2%
RGB 4:4:4 SC	-10.9%	-9.4%	-9.9%	-11.3%	-10.3%	-10.8%
RGB 4:4:4 Animation	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
YCbCr 4:4:4 SC	-6.6%	-10.0%	-12.2%	-8.9%	-11.2%	-12.6%
YCbCr 4:4:4 Animation	0.1%	-0.2%	-0.2%	0.1%	-0.1%	-0.1%
RangeExt	0.0%	0.3%	0.2%	0.0%	0.2%	0.1%
RGB 4:4:4 SC (Optional)	-16.8%	-16.7%	-16.8%	-19.8%	-19.4%	-19.7%
YCbCr 4:4:4 SC (Optional)	-16.2%	-15.8%	-16.0%	-17.4%	-17.1%	-17.3%
Enc Time[%]	99.7%			100.6%		
Dec Time[%]	97.2%			98.6%		

Conclusion

■ Results compared to RCE4 Test 2:

- Gains: SC: 7.7% / 7.7% / 9.4%
- OSC: 12% / 12% / 18%

■ Recommend to use these modifications of the palette prediction method if the Palette Mode coding is adopted for the Range Extensions.