

# **JVET-P0801**

## **CE2/CE3-related : Lossless coding for palette coding**

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# Proposed method

- From JVET-Q0491, EG5 for escape value binarization is adopted at this meeting
- Worst case bin length for escape value (for 10-bit input)
  - FLC: 30 bins per sample
  - EG5: 48 bins per sample
- Binarization selection flag is proposed to indicate either FLC or EG5 is utilized
  - High level binarization switch is transmitted after sps\_palette\_enabled\_flag
  - It helps more blocks to be coded with palette mode, with better coding gain

		EG5	FLC
ChineseEditing, first 40 frames, AI, DualTree=0	# Pixels of escape value	413,340	691,077

**67.2%** more pixels can be coded  
as escape values

# Experimental result (Lossless)

## ■ DualTree = 1

	All Intra			Random Access		
	Compression Ratio		Bit-rate savings	Compression Ratio		Bit-rate savings
	VTM-7.0	Tested		VTM-7.0	Tested	
TGM 1080p	21.0	21.6	-3.11%	43.4	44.7	-2.85%
TGM 720p	11.9	12.0	-1.36%	14.6	14.9	-0.84%
Animation	6.1	6.1	-0.09%	1.7	1.7	-0.03%
Mixed content	5.6	5.7	-1.81%	4.6	4.6	-0.30%
Camera-captured	1.9	1.9	-0.16%	0.3	0.3	-0.01%
<b>Overall</b>	10.6	10.9	<b>-1.49%</b>	15.7	16.1	<b>-0.99%</b>
Enc Time[%]	100%			99%		
Dec Time[%]	99%			99%		

## ■ DualTree = 0

	All Intra			Random Access		
	Compression Ratio		Bit-rate savings	Compression Ratio		Bit-rate savings
	VTM-7.0	Tested		VTM-7.0	Tested	
TGM 1080p	27.6	28.9	-4.94%	55.1	57.2	-3.54%
TGM 720p	14.4	14.6	-1.74%	17.7	17.9	-0.70%
Animation	6.2	6.2	-0.02%	1.7	1.7	-0.03%
Mixed content	6.4	6.5	-1.50%	4.7	4.7	-0.22%
Camera-captured	1.9	1.9	0.00%	0.3	0.3	0.00%
<b>Overall</b>	13.1	13.5	<b>-1.95%</b>	19.4	20.0	<b>-1.10%</b>
Enc Time[%]	100%			100%		
Dec Time[%]	96%			98%		

# Experimental result for low QP : FLC / EG5

	All Intra Main10									
	DualTree=1					DualTree=0				
	Over VTM-7.0					Over VTM-7.0				
	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT
TGM 1080p	-0.99%	-1.13%	-1.19%	99%	99%	-2.14%	-2.49%	-2.49%	99%	97%
TGM 720p	-0.44%	-0.47%	-0.43%	100%	99%	-0.81%	-0.83%	-1.00%	100%	100%
Animation	-0.21%	-0.10%	-0.12%	99%	98%	-0.12%	-0.16%	-0.14%	98%	101%
Mixed content	-0.82%	-1.19%	-1.29%	99%	96%	-1.14%	-1.63%	-1.64%	100%	98%
Camera-Captured content	0.00%	0.00%	0.00%	98%	98%	0.00%	0.01%	-0.01%	99%	101%
Overall	-0.55%	-0.64%	-0.67%	99%	98%	-0.97%	-1.17%	-1.21%	99%	99%
	Random access Main10									
	DualTree=1					DualTree=0				
	Over VTM-7.0					Over VTM-7.0				
	Y	U	V	EncT	DecT	Y	U	V	EncT	DecT
TGM 1080p	-0.93%	-0.91%	-0.93%	99%	101%	-1.65%	-1.69%	-1.64%	99%	100%
TGM 720p	-0.63%	-0.24%	-0.18%	100%	103%	-0.66%	-0.73%	-0.65%	100%	101%
Animation	0.04%	0.02%	0.04%	100%	100%	0.03%	0.05%	0.01%	100%	100%
Mixed content	-0.69%	0.07%	0.01%	98%	102%	-0.69%	-0.73%	-0.61%	99%	100%
Camera-Captured content	-0.01%	0.00%	0.01%	101%	99%	0.00%	0.01%	0.01%	101%	100%
Overall	-0.51%	-0.27%	-0.27%	100%	101%	-0.70%	-0.73%	-0.68%	100%	100%

# Conclusion

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- Binarization indication for escape value in high level is proposed
  - In lossless coding, escape value coding plays more important role for coding efficiency
    - More than 3% of coding gain for TGM 1080p
  - Significant coding gain can be observed both in lossless and low-QP cases without QP dependency
  - The number of worst case number of bins are reduced
  
- It is suggested to be adopted to the next VVC