

**MEDIATEK**

# CE2-related: IntraBC constraint for multiple slices

Tzu-Der (Peter) Chuang, Xiaozhong Xu,  
Yu-Wen Huang, Shan Liu, Shawmin Lei

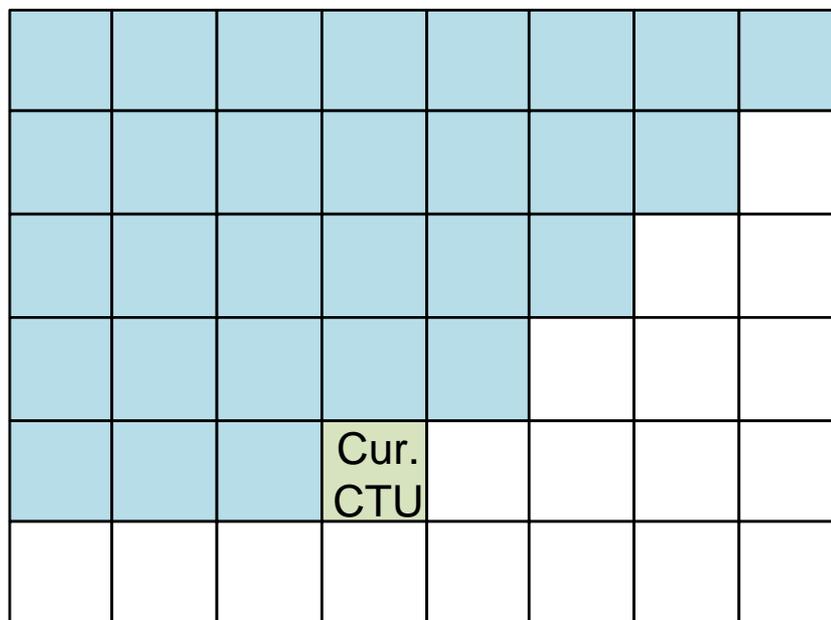
Presented by Tzu-Der (Peter) Chuang  
20<sup>th</sup> JCT-VC Meeting in Geneva  
10–18 Feb. 2015

# Overview Summary

- Proposed to limit the reference area of an IntraBC block to reconstructed samples within the same slice such that each slice can be reconstructed independently
  - In SCM-3.0, when the multi-slice configuration is applied, the search area includes the CTUs of non-current slices
  - Violates the principle of reconstructing each slice independently

# IntraBC Search Area Constraint

- In SCM-3.0 IntraBC search, a ladder shape search area constraint is applied
  - For an IntraBC block in current CTU, its available search area is constrained to the blue CTUs and the reconstructed blocks in the current CTU



# IntraBC Search Area for Multi-slice Configuration

- In SCM-3.0, when the multi-slice configuration is applied, the search area includes the CTUs of non-current slices
- Violates the principle of reconstructing each slice independently

0	1	2	3	4	5	6	7
8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23
24	25	26	27	28	29	30	31
32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47

# Proposed IntraBC Search Area Constraint for Multi-slice Configuration

- Proposed to limit the reference area of an IntraBC block to reconstructed samples within the same slice

0	1	2	3	4	5	6	7
8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23
24	25	26	27	28	29	30	31
32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47

# Lossy Coding Result for Multi-slice Configuration

- Multi-slice configuration with maximum of 150 CTUs per slice
  - Anchor: SCM-3.0
  - Test: proposed constraint for multi-slice configuration

	All Intra			Random Access			Low delay B		
	G/Y	B/U	R/V	G/Y	B/U	R/V	G/Y	B/U	R/V
RGB, text & graphics with motion, 1080p & 720p	1.1%	1.1%	1.1%	0.5%	0.5%	0.5%	0.1%	0.2%	0.3%
RGB, mixed content, 1440p & 1080p	3.4%	3.1%	3.1%	2.1%	2.0%	1.9%	0.9%	0.6%	0.4%
RGB, Animation, 720p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%
RGB, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
YUV, text & graphics with motion, 1080p & 720p	1.2%	1.1%	1.1%	0.6%	0.5%	0.4%	0.2%	-0.1%	0.1%
YUV, mixed content, 1440p & 1080p	3.2%	2.4%	2.4%	2.2%	1.5%	1.4%	1.1%	-0.1%	-0.2%
YUV, Animation, 720p	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	-0.1%	0.1%
YUV, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%	-0.1%	0.0%	0.0%	-0.1%	-0.2%

# Lossless Coding Result for Multi-slice Configuration

- Multi-slice configuration with maximum of 150 CTUs per slice
  - Anchor: SCM-3.0
  - Test: proposed constraint for multi-slice configuration

	All Intra				Random Access				Low Delay B			
	Bit-rate change (Total)	Bit-rate change (Average)	Bit-rate change (Min)	Bit-rate change (Max)	Bit-rate change (Total)	Bit-rate change (Average)	Bit-rate change (Min)	Bit-rate change (Max)	Bit-rate change (Total)	Bit-rate change (Average)	Bit-rate change (Min)	Bit-rate change (Max)
RGB, text & graphics with motion, 1080p & 720p	0.8%	0.8%	0.0%	2.3%	0.8%	0.5%	0.0%	1.8%	0.8%	0.4%	0.0%	1.9%
RGB, mixed content, 1440p & 1080p	4.1%	3.7%	0.7%	7.8%	0.9%	0.9%	0.1%	2.1%	0.6%	0.6%	0.0%	1.5%
RGB, Animation, 720p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RGB, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
YUV, text & graphics with motion, 1080p & 720p	0.9%	0.9%	0.0%	2.4%	0.8%	0.5%	0.0%	1.7%	0.8%	0.4%	0.0%	1.7%
YUV, mixed content, 1440p & 1080p	4.5%	4.1%	0.8%	8.7%	0.9%	1.0%	0.1%	2.4%	0.6%	0.6%	0.0%	1.6%
YUV, Animation, 720p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
YUV, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

# Conclusion

- Proposed to limit the reference area of an IntraBC block to reconstructed samples within the same slice
- Each slice can be reconstructed independently