

JCTVC-H0184

Non-CE1: Encoder modification for SAO interleaving mode

G. LAROCHE, T. POIRIER, P. ONNO

JCT-VC 9th Meeting: Geneva, CH, 27 April – 7 May 2012

Proposal overview

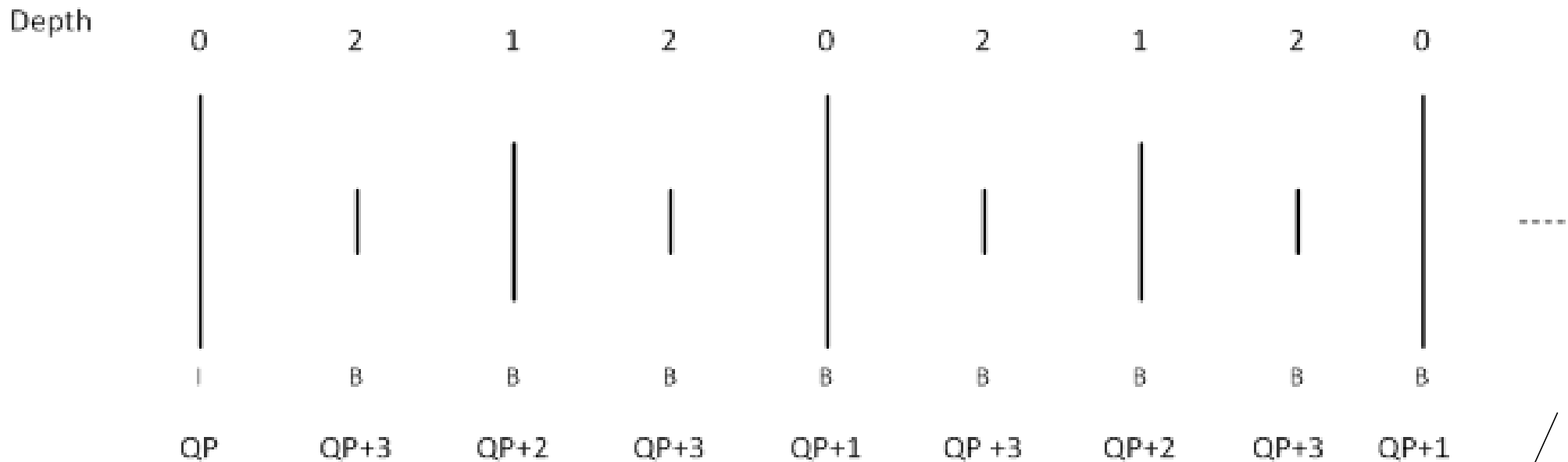
- **Context: SAO Interleaving mode**
 - SAO parameters are transmitted for each LCU
 - In HM6.0, the current LCU SAO syntax significantly increases the bitrate dedicated to SAO
 - Quite inefficient for certain frames
- **Proposal: Modification of SAO at encoder side**
 - Selection to turn on/off SAO at slice/frame level
 - Syntax element already exists: `slice_sample_adaptive_offset_flag`
 - Non-normative change.

HM6.0 SAO selection analysis

- Statistical selection

- SAO is less selected on Depth 1 & 2 than Depth 0
- When SAO is rarely selected, the SAO syntax is only dedicated to signaling the non-usage of SAO.

- Hierarchical Structure for Low Delay configurations:



Proposed criterion at the encoder side

- Depth 0: SAO is always “on”
- Depth 1 & 2: Turn on/off SAO at slice level according to the following criterion:
 - If more than 25% of LCU uses SAO on previous frame of Depth=0
 - Activate SAO in Depth 1 & 2: `slice_sample_adaptive_offset_flag = 1`
 - else
 - Disable SAO in Depth 1 & 2: `slice_sample_adaptive_offset_flag = 0`
- Only 25 modified lines in the source code

Results

	Low delay B Main LCU 16x16			Low delay B HE10 LCU 16x16		
	Y	U	V	Y	U	V
Class A						
Class B	-0.9%	-1.0%	-1.1%	-0.9%	-1.0%	-0.9%
Class C	-0.7%	-0.5%	-0.5%	-0.6%	-0.8%	-0.6%
Class D	-1.0%	-1.2%	-1.0%	-1.0%	-0.7%	-0.7%
Class E	-4.7%	-4.1%	-4.2%	-4.7%	-4.0%	-3.9%
Overall	-1.6%	-1.5%	-1.5%	-1.6%	-1.4%	-1.4%
	-1.6%	-1.5%	-1.5%	-1.6%	-1.4%	-1.4%
Class F	-2.0%	-2.4%	-2.7%	-2.1%	-2.5%	-2.1%
Enc Time[%]		100%			99%	
Dec Time[%]		100%			101%	

	Low delay B Main LCU 32x32			Low delay B HE10 LCU 32x32		
	Y	U	V	Y	U	V
Class A						
Class B	-0.2%	-0.5%	-1.0%	-0.3%	-0.3%	-0.2%
Class C	-0.3%	-0.6%	-0.5%	-0.4%	-0.3%	-0.4%
Class D	-0.8%	-0.8%	-1.2%	-0.8%	-0.6%	-1.4%
Class E	-2.6%	-2.6%	-2.2%	-2.5%	-2.2%	-2.2%
Overall	-0.8%	-1.0%	-1.2%	-0.9%	-0.8%	-0.9%
	-0.8%	-1.0%	-1.1%	-0.9%	-0.8%	-0.9%
Class F	-0.3%	-0.3%	-0.3%	-0.7%	-0.6%	-0.6%
Enc Time[%]		100%			100%	
Dec Time[%]		100%			100%	

	Low delay B Main LCU 64x64			Low delay B HE10 LCU 64x64		
	Y	U	V	Y	U	V
Class A						
Class B	-0.1%	-0.1%	-0.1%	-0.1%	-0.2%	0.1%
Class C	-0.1%	-0.1%	-0.1%	-0.2%	0.0%	-0.3%
Class D	-0.3%	-0.2%	0.3%	-0.4%	-0.7%	-0.2%
Class E	-1.5%	-1.5%	-1.9%	-1.7%	-1.4%	-1.1%
Overall	-0.4%	-0.4%	-0.3%	-0.5%	-0.5%	-0.3%
	-0.4%	-0.4%	-0.4%	-0.5%	-0.6%	-0.4%
Class F	0.2%	-0.1%	-0.2%	-0.1%	0.2%	-0.6%
Enc Time[%]		100%			100%	
Dec Time[%]		99%			98%	

Low Delay B			
LCU size	Y	U	V
16x16	-1.6%	-1.5%	-1.4%
32x32	-0.9%	-0.9%	-1.0%
64x64	-0.5%	-0.4%	-0.3%

Conclusion

- Encoding choice to turn on/off SAO at slice/frame level for interleaving mode
- Results: similar to those obtained in CE1 with a normative change
 - LDB 64x64: -0.5%
 - LDB 16x16: -1.6%
- Non normative change !
 - No CD text modification
- Only 25 lines of source code

Propose to adopt