

# JCTVC-F608: Removing Chroma Zonal Coding in CAVLC

# Proposal

- Last meeting zonal coding was removed for CAVLC luma component - CAVLC coding was extended to 16x16 and 32x32 blocks.
  - Gains of 2.9%, 1.4% and 1.0% were reported for intra only, random access and low delay configurations.
- Chroma is still using zonal coding for blocks larger than 8x8 block.
  - Inter blocks: upper left 8x8 block coded.
  - Intra blocks: first 64 coefficients along scan order coded.
- Proposed to use remove zonal coding for chroma.
  - No modifications to chroma coding, only remove restriction on number of coded coefficients.

All Intra LC			Random Access LC			Low delay B LC		
Y	U	V	Y	U	V	Y	U	V
0.0	-0.5	-0.5	0.0	-0.7	-1.4			
0.0	-0.1	-0.1	0.0	-0.1	-0.1	0.0	-0.3	-0.4
0.0	-0.1	0.0	0.0	0.0	-0.1	0.0	-0.2	-0.3
0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.3	0.2
0.0	0.1	0.0				-0.1	-0.5	-0.5
<b>0.0</b>	<b>-0.1</b>	<b>-0.1</b>	<b>0.0</b>	<b>-0.2</b>	<b>-0.4</b>	<b>0.0</b>	<b>-0.2</b>	<b>-0.2</b>
	100%			101%			99%	
	101%			100%			100%	

# Codewords Length

- Codewords longer than 32 bits can be created when chroma extended to 16x16 blocks.

	vlcNumIdx																
blockType	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0	10	10	10	10	2	2	2	7	9	9	9	9	9	4	4	4	4
1	10	10	10	10	10	2	9	9	9	9	9	9	9	4	4	4	4

	vlcNumIdx																
blockType	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0	10	10	10	10	2	2	2	2	9	9	9	9	9	4	4	4	4
1	10	10	10	10	10	2	9	9	9	9	9	9	9	4	4	4	4

- Modify VLC table for vlcNum=9, by concatenating Golomb codes with two different parameters k:
  - Golomb code with k=4 used till value 266, is concatenated with Golomb code k=7.
- Codewords longer than 32 bits can be created also for luma blocks.

All Intra LC			Random Access LC			Low delay B LC		
Y	U	V	Y	U	V	Y	U	V
0.0	-0.5	-0.5	0.0	-0.7	-1.5			
0.0	-0.1	-0.1	0.0	-0.1	-0.1	0.0	-0.2	-0.3
0.0	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	-0.4
0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.3	0.1
0.0	0.1	0.0				-0.1	-0.6	-0.6
<b>0.0</b>	<b>-0.1</b>	<b>-0.1</b>	<b>0.0</b>	<b>-0.2</b>	<b>-0.4</b>	<b>0.0</b>	<b>-0.1</b>	<b>-0.3</b>
	99%			97%			98%	
	100%			98%			99%	