

JVET-P0531

Non-CE3: Removal of 2xN chroma Intra blocks

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Problem and related works

■ Problem

- 2xN intra chroma blocks lead to inefficient hardware implementation

■ Related works at last meeting

- 2x2/2x4/4x2 chroma intra blocks were removed by local dual tree (JVET-00050)
- 1xN/2xN intra resulting from ISP were removed
- JVET-00398 proposed to remove 2xN chroma intra blocks in dual-tree

■ Commented in the meeting notes of last meeting: Further study removing 2xN chroma intra in single tree

Summary of proposal JVET-P0531

■ Proposal

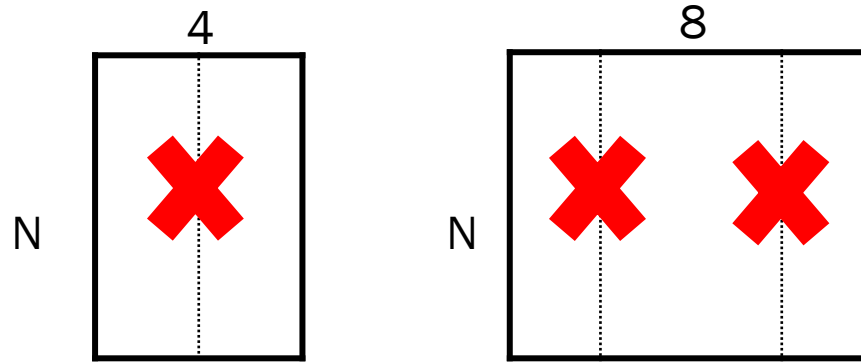
- Test 1: remove 2x8 chroma intra
- Test 2: remove all 2x8, 2x16 and 2x32 chroma intra
- Test 3: remove 2x16 and 2x32 chroma intra
- Test 4: joint of Test 2 and JVET-P0596

■ Experimental Results

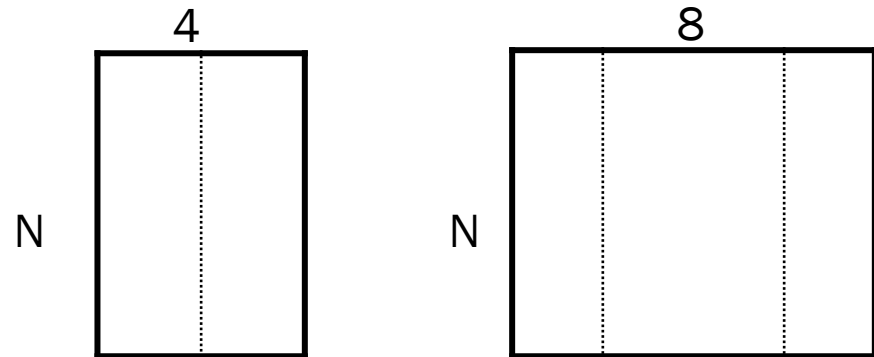
BD-Rate Y	AI	RA
Test 1	0.00%	0.08%
Test 2	0.01%	0.12%
Test 3	0.00%	0.05%
Test 4	0.01%	0.11%

Proposal: remove 2xN chroma intra blocks

- Remove 2xN chroma dual tree by split constraint



- Remove regular 2xN chroma in single tree by extending local dual tree



→ Local dual tree: Chroma no split

- Remove CIIP 2xN chroma intra by disallowing 4xN CIIP

Results of Test 1 ~ Test 3

- Test 1: Remove 2x8 chroma intra blocks
- Test 2: Remove 2x8/2x16/2x32 chroma intra blocks
- Test 3: Remove 2x16/2x32 chroma intra blocks

		Y	U	V
Test 1	AI	0.00%	0.16%	0.23%
	RA	0.08%	0.27%	0.31%
Test 2	AI	0.01%	0.35%	0.37%
	RA	0.12%	0.50%	0.49%
Test 3	AI	0.00%	0.15%	0.12%
	RA	0.05%	0.20%	0.15%

Test 4: A joint proposal (JVET-P0641)

■ Test 4: joint test of Test 2 and JVET-P0596

- Remove 2x8/2x16/2x32 in dual tree by split restriction
- Remove regular 2x8/2x16/2x32 chroma intra in single tree by local dual tree
- Remove CIIP 2x8/2x16/2x32 chroma intra by using CIIP for only luma component

		Y	U	V
Test 4	AI	0.01%	0.35%	0.37%
	RA	0.11%	0.50%	0.49%

■ Dual Tree Off, AI test

	Y	U	V	EncT	DecT
Test 4	-0.02%	-0.18%	-0.22%	97%	100%

Conclusions

- Remove completely 2xN chroma intra in both dual tree and single tree

BD-Rate Y	AI	RA
Remove 2x8	0.00%	0.08%
Remove 2x8/2x16/2x32 (Disable CIIP for 4xN)	0.01%	0.12%
Remove 2x18/2x32	0.00%	0.05%
Remove 2x8/2x16/2x32 (Disable CIIP for 2xN)	0.01%	0.11%

- It is recommended adopting Test 4

Thanks Qualcomm for crosschecking! (Test 1-3, JVET-P0805)

Thanks LGE for crosschecking! (Test 4, JVET-P0641)

Spec changes of Test 4

If one or more of the following conditions are true, allowBtSplit is set equal to FALSE:

...

treeType is equal to DUAL_TREE_CHROMA and btSplit is equal to SPLIT_BT_VER and (cbWidth / SubWidthC) is equal to 4

...

If one or more of the following conditions are true, allowTtSplit is set equal to FALSE:

...

treeType is equal to DUAL_TREE_CHROMA and ttSplit is equal to SPLIT_TT_VER and (cbWidth / SubWidthC) is equal to 8

...

If one of the following conditions is true, modeTypeCondition is set equal to 0

...

Otherwise, if one of the following conditions is true, modeTypeCondition is set equal to 1

...

Otherwise, if one of the following conditions is true, modeTypeCondition is set equal to 1 + (slice_type != 1 ? 1 : 0)

...

(cbWidth / SubWidthC) is equal to 4 and MttSplitMode[x0][y0][mttDepth] is equal to SPLIT_BT_VER

(cbWidth / SubWidthC) is equal to 8 and MttSplitMode[x0][y0][mttDepth] is equal to SPLIT_TT_VER

...

When ciip_flag[xCb][yCb] is equal to 1, the array predSamples of prediction samples is modified as follows:

...

Otherwise, if cldx is equal to 1 and xCb / SubWidthC is greater than or equal to 4, the following applies:

...

Otherwise (cldx is equal to 2), if xCb / SubWidthC is greater than or equal to 4, the following applies:

...