

JVET-N0159

Non-CE3: Relaxation method of processing dependency in ISP for small blocks

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■ Problem statement

- When ISP is applied, sub-partition width or height is sometimes less than 4 pixels.
- Especially, implementation difficulty with 1xN and 2xN cases is pointed out.

■ Proposal

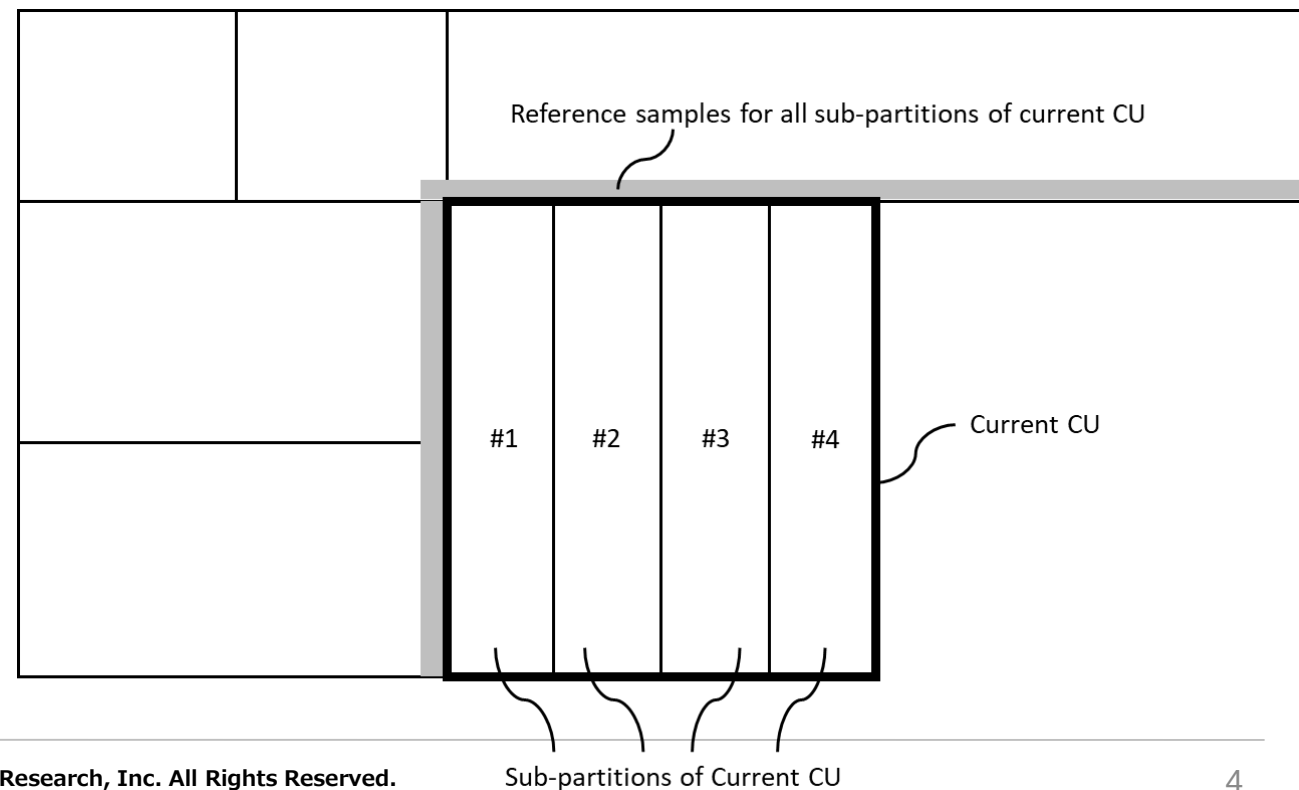
- For small blocks with ISP, prediction is processed by CU.
 - Test 1: Prediction by CU when width or height is less than 4 pixels
 - Test 2: Prediction by CU when width is less than 4 pixels
- Test 2 is more relevant to the above problem than Test 1.
 - Focus on Test 2 in this presentation
- Transform and reconstruction can be processed in parallel for each sub-partition.

■ Experimental results

- Test 2: 0.06% loss in comparison with VTM4.0 for AI condition

- **ISP (Intra Sub-Partitions) was adopted to VVC at the last meeting.**
- **When ISP is applied, sub-partition width or height is sometimes less than 4 pixels.**
- **Especially, implementation difficulty with 1xN and 2xN cases is pointed out.**
- **It is necessary to relax processing dependency for small blocks in ISP case.**
- **Our proposal is implemented on top of the VTM-4.0**

- For small blocks with ISP, prediction is processed by CU (as same as No ISP case).
- For large blocks, ISP process has not been changed.
- Definition of “small block”
 - Test 2: Prediction by CU when sub-partition width < 4 pixles
- Transform and reconstruction for each sub-partition can be processed in parallel



■ Anchor: VTM-4.0

■ Test 2 (Prediction by CU when sub-partition width < 4 pixels)

Cond.	Y	U	V	EncT	DecT
AI	0.06%	0.07%	0.05%	100%	100%
RA	0.02%	-0.02%	-0.08%	100%	99%

■ Reference data

- simply disallow ISP when sub-partition width < 4 pixels

Cond.	Y	U	V	EncT	DecT
AI	0.13%	0.13%	0.10%	99%	99%

■ **BD-rate loss (AI) is less than the case of simply disallowing ISP in small blocks**

■ **BD-rate loss (RA) is negligible**

■ Proposal

- For small blocks, prediction is processed by CU with ISP case.
 - Test 2: Prediction by CU when width is less than 4 pixels
- Transform can be processed in parallel for each sub-partition.

■ Experimental results

- Test 2: 0.06% loss in comparison with VTM4.0 for AI condition

■ Proposal is recommended to further study in CE.

■ Thank HHI for cross-checking.