

The background is a solid green color with a repeating pattern of white line-art icons. These icons include various nautical items like anchors, lifebuoys, and seashells, as well as outdoor and travel-related items like a compass, a map, a camera, and a bird in flight.

**MEDIATEK**

# **JVET-N0096**

## **CE8-related: A fixed updating order for IBC reference memory**

**Authors: Chen-Yen Lai, Tzu-Der Chuang, Ching-Yeh Chen, Yu-Wen Huang, Shaw-Min Lei**

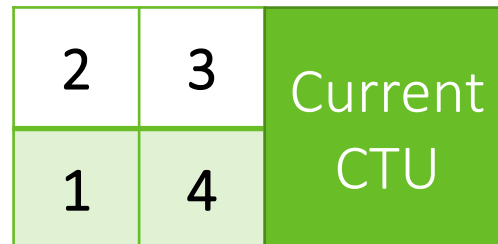
**Presenter: Chen-Yen Lai**

# Overall Summary

- Proposed a fixed updating order for IBC reference memory

- Fixed updating order: “BL → TL → TR → BR ”

64x64 block of the left CTU



- Add an encoder-only normative constraint to ensure the maximum luma CB size for IBC is 64×64

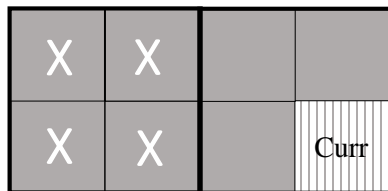
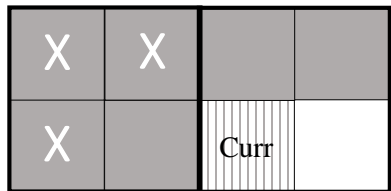
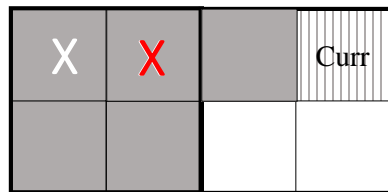
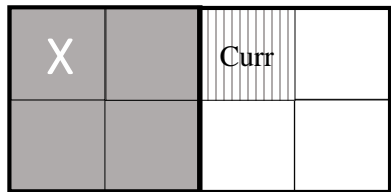
- Experimental results

Compared to VTM-4.0 with IBC	Proposed Method ( Luma BD-rates)		
	CTC	Class F	TGM
AI	0.00%	-0.64%	-1.63%
RA	0.00%	-0.51%	-0.76%

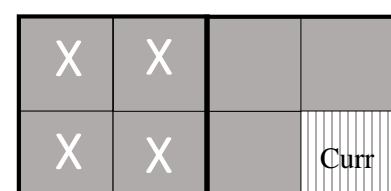
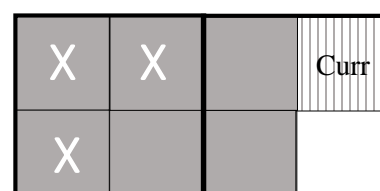
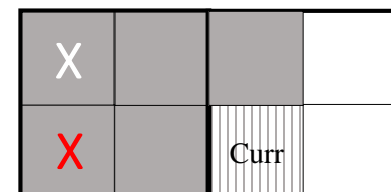
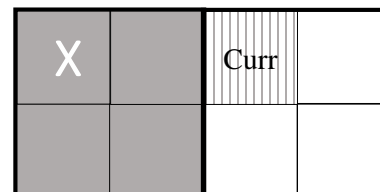
# Updating IBC Reference Memory in VTM-4.0

- Depend on the coding order of current CTU.

Case 1



Case 2



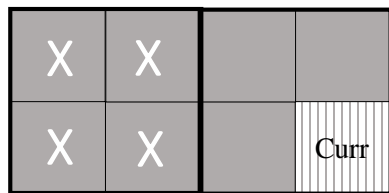
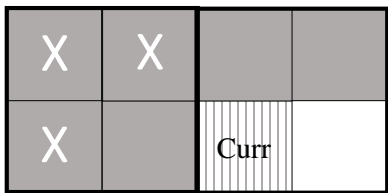
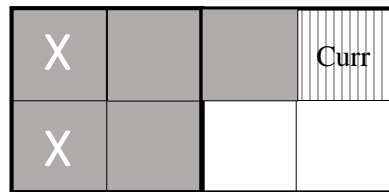
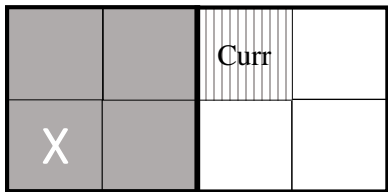
Different updating orders!!

# Proposed Method

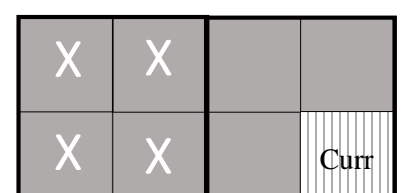
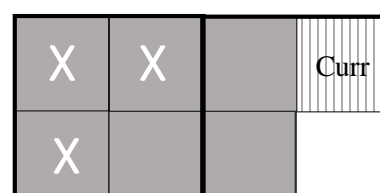
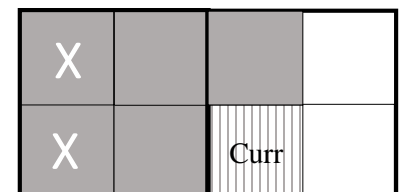
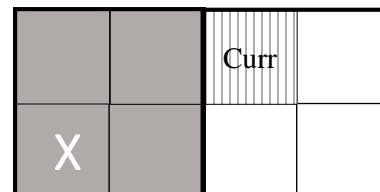
- Only one updating order is applied regardless of the CB order within the current CTU
  - Before the current CTU is decoded, all the reconstructed samples of the left CTU are stored in the IBC reference memory.
  - The order is “BL → TL → TR → BR” 64x64 block of the left CTU.

2	3
1	4

Case 1



Case 2



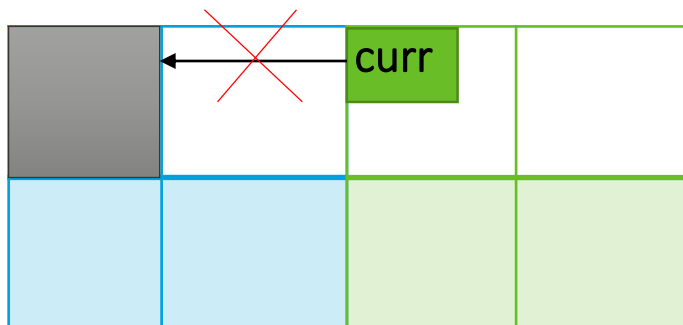
# Simulation Results

- Implemented on top of VTM-4.0

Compared to VTM-4.0 with IBC		Proposed Method		
		Y	U	V
AI	CTC	0.00%	-0.02%	-0.01%
	Class F	-0.64%	-0.58%	-0.65%
	TGM	-1.63%	-1.66%	-1.68%
RA	CTC	0.00%	0.00%	-0.03%
	Class F	-0.51%	-0.54%	-0.66%
	TGM	-0.76%	-0.78%	-0.80%

# Reference Simulation Results

- Add a constraint to avoid the first CU in the current CTU to reference the collocated 64x64 area in the previous CTU



# Conclusion

- Proposed a **fixed updating order** for intra block copy (IBC) reference memory regardless of the CB order within the current CTU
  - The order is “**BL → TL → TR → BR**” 64x64 block of the left CTU
  - Add an encoder-only normative constraint to ensure the maximum luma CB size for IBC is 64x64
- Experimental results
  - Provides 0.00%, -0.64%, -1.63%, luma BD-rates gain for AI in classA/B/C/E, class F, and TGM against VTM-4.0 with IBC, respectively
- Thank Alibaba for cross-checking

2	3
1	4

