JCT3V-H0070
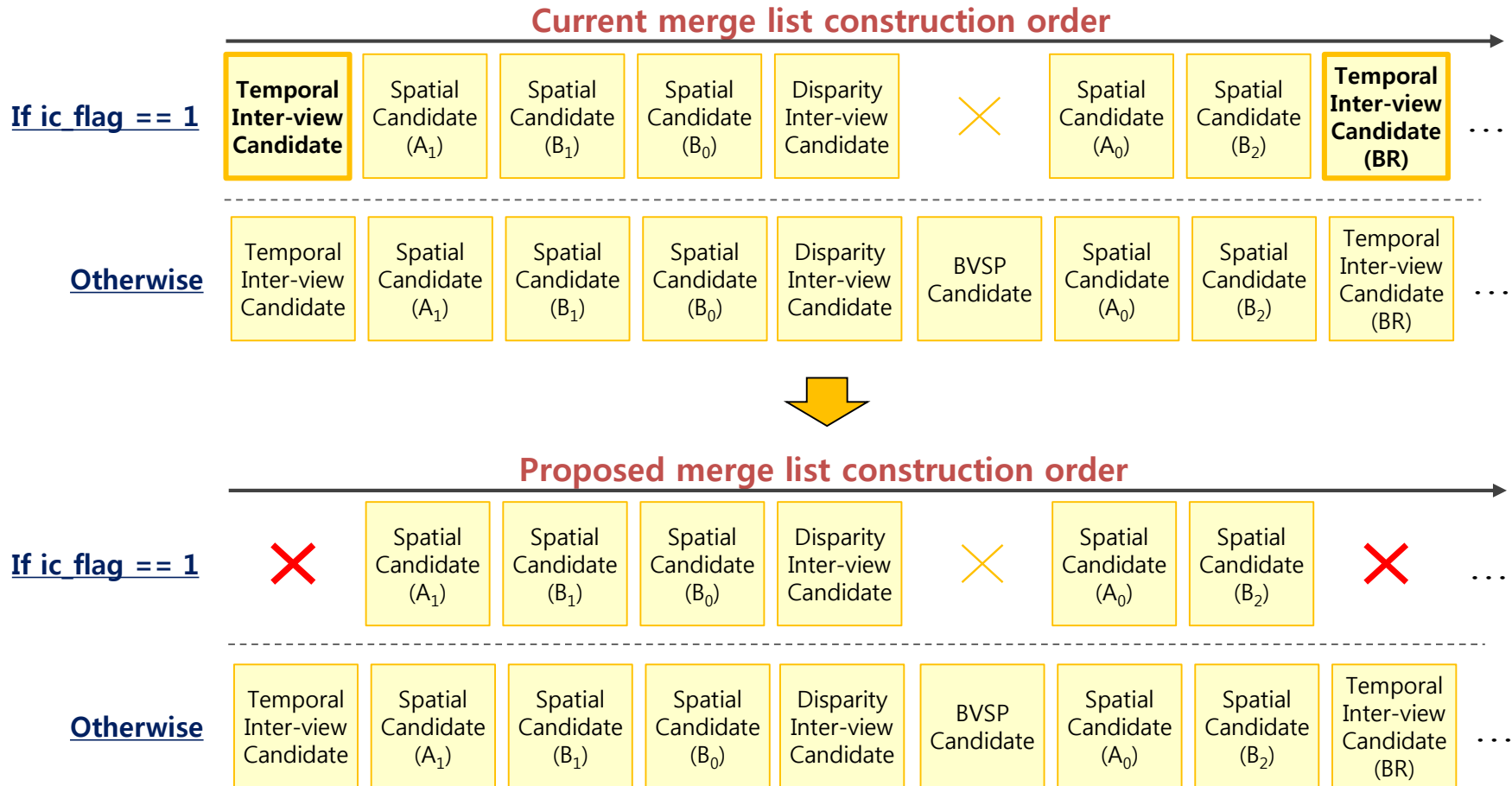# CE1: Results on Adaptive Disabling IVMV Candidates

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Introduction

- ❖ IC (illumination compensation) is only applied to the inter-view prediction
  - ▪ IVMV (inter-view motion vector) candidates always perform the temporal prediction
    - • IC is never used for IVMV candidates
    - • ic_flag is always set to '0' and sometimes signaled
  - ▪ Therefore, IVMV candidates need to be adaptively disabled in merge candidates list according to the value of ic_flag

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Proposed Method

❖ We propose to disable IVMV candidate from the merge list when IC is enabled

Current merge list construction order

If ic_flag == 1

| Temporal Inter-view Candidate | Spatial Candidate (A_1) | Spatial Candidate (B_1) | Spatial Candidate (B_0) | Disparity Inter-view Candidate | ✕ | Spatial Candidate (A_0) | Spatial Candidate (B_2) | Temporal Inter-view Candidate (BR) | · · · |

Otherwise

| Temporal Inter-view Candidate | Spatial Candidate (A_1) | Spatial Candidate (B_1) | Spatial Candidate (B_0) | Disparity Inter-view Candidate | BVSP Candidate | Spatial Candidate (A_0) | Spatial Candidate (B_2) | Temporal Inter-view Candidate (BR) | · · · |

Proposed merge list construction order

If ic_flag == 1

| ✕ | Spatial Candidate (A_1) | Spatial Candidate (B_1) | Spatial Candidate (B_0) | Disparity Inter-view Candidate | ✕ | Spatial Candidate (A_0) | Spatial Candidate (B_2) | ✕ | · · · |

Otherwise

| Temporal Inter-view Candidate | Spatial Candidate (A_1) | Spatial Candidate (B_1) | Spatial Candidate (B_0) | Disparity Inter-view Candidate | BVSP Candidate | Spatial Candidate (A_0) | Spatial Candidate (B_2) | Temporal Inter-view Candidate (BR) | · · · |

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Regarding Pruning Process

❖ With the pruning using the motion information of IVMV candidate

  ▪ Motion info. of IVMV candidate can be used for the pruning of left and above candidates

❖ Without the pruning

  ▪ This can simplify the merge list construction process since the IVMV derivation can be omitted

  ▪ IVMV derivation need to access the motion parameters of the corresponding block in the reference view

    • In the worst case, 64 motion parameters need to be accessed for 64 Sub-PU when the current CU size is 64x64 and the Sub-PU size is 8x8.

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Simulation Results (Test 1)

❖ Based on CTC with HTM 10.0r1 reference software

❖ Test 1: Proposed method with the pruning (CE)

- 0.04% & 0.01% bit-saving for coded and synthesized views, respectively

	video 0	video 1	video 2	video PSNR / video bitrate	video PSNR / total bitrate	synth PSNR / total bitrate	enc time	dec time	ren time
Balloons	0.00%	0.03%	-0.03%	-0.03%	-0.04%	-0.01%	99.7%	102.4%	97.7%
Kendo	0.00%	-0.29%	-0.07%	-0.09%	-0.08%	-0.01%	99.2%	99.7%	99.3%
Newspaper_CC	0.00%	0.01%	-0.07%	0.00%	-0.02%	0.01%	99.0%	101.5%	98.7%
GT_Fly	0.00%	0.00%	-0.01%	0.00%	0.00%	0.00%	99.2%	94.9%	99.3%
Poznan_Hall2	0.00%	0.03%	-0.15%	-0.09%	-0.14%	-0.03%	97.5%	92.9%	90.0%
Poznan_Street	0.00%	-0.18%	-0.01%	-0.04%	-0.03%	-0.03%	97.9%	92.3%	92.5%
Undo_Dancer	0.00%	-0.08%	0.01%	-0.01%	-0.01%	-0.01%	98.7%	91.9%	92.2%
Shark	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	98.4%	100.2%	98.8%
1024x768	0.00%	-0.08%	-0.05%	-0.04%	-0.05%	0.00%	99.3%	101.2%	98.6%
1920x1088	0.00%	-0.05%	-0.03%	-0.03%	-0.04%	-0.01%	98.4%	94.4%	94.6%
average	**0.00%**	**-0.06%**	**-0.04%**	**-0.03%**	**-0.04%**	**-0.01%**	**98.7%**	**97.0%**	**96.1%**

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Simulation Results (Test 2)

❖ Based on CTC with HTM 10.0r1 reference software

❖ Test 2: Proposed method without the pruning (CE w/ Simplification)
  - 0.02% & 0.03% bit-saving for coded and synthesized view, respectively

	video 0	video 1	video 2	video PSNR / video bitrate	video PSNR / total bitrate	synth PSNR / total bitrate	enc time	dec time	ren time
Balloons	0.00%	0.17%	-0.06%	0.00%	0.01%	0.02%	100.7%	101.8%	100.8%
Kendo	0.00%	-0.18%	-0.10%	-0.07%	-0.06%	-0.05%	100.1%	100.2%	100.9%
Newspaper_CC	0.00%	-0.11%	-0.10%	-0.03%	-0.04%	-0.05%	99.9%	106.3%	101.4%
GT_Fly	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.3%	95.7%	101.6%
Poznan_Hall2	0.00%	-0.18%	-0.10%	-0.04%	-0.06%	-0.07%	99.0%	95.7%	92.2%
Poznan_Street	0.00%	-0.16%	-0.04%	-0.04%	-0.03%	-0.03%	98.9%	91.5%	95.9%
Undo_Dancer	0.00%	-0.04%	0.02%	0.00%	0.00%	-0.03%	99.8%	92.2%	95.0%
Shark	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	99.1%	97.1%	105.5%
1024x768	0.00%	-0.04%	-0.09%	-0.03%	-0.03%	-0.03%	100.2%	102.8%	101.0%
1920x1088	0.00%	-0.07%	-0.03%	-0.02%	-0.02%	-0.03%	99.4%	94.4%	98.0%
average	**0.00%**	**-0.06%**	**-0.05%**	**-0.02%**	**-0.02%**	**-0.03%**	**99.7%**	**97.5%**	**99.2%**

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Conclusion

❖ We proposed to disable IVMV candidate when IC is enabled

- Without pruning process, up to 64 derivations of motion parameter can be saved
- 0.02% & 0.03% bit-saving for coded and synthesized views

❖ We recommend to adopt the simplified method into next 3D-HEVC WD

Thanks Sharp for the cross checking (JCT3V-H0179).