

SHVC/MV-HEVC HLS: High-level syntax for temporal motion vector prediction

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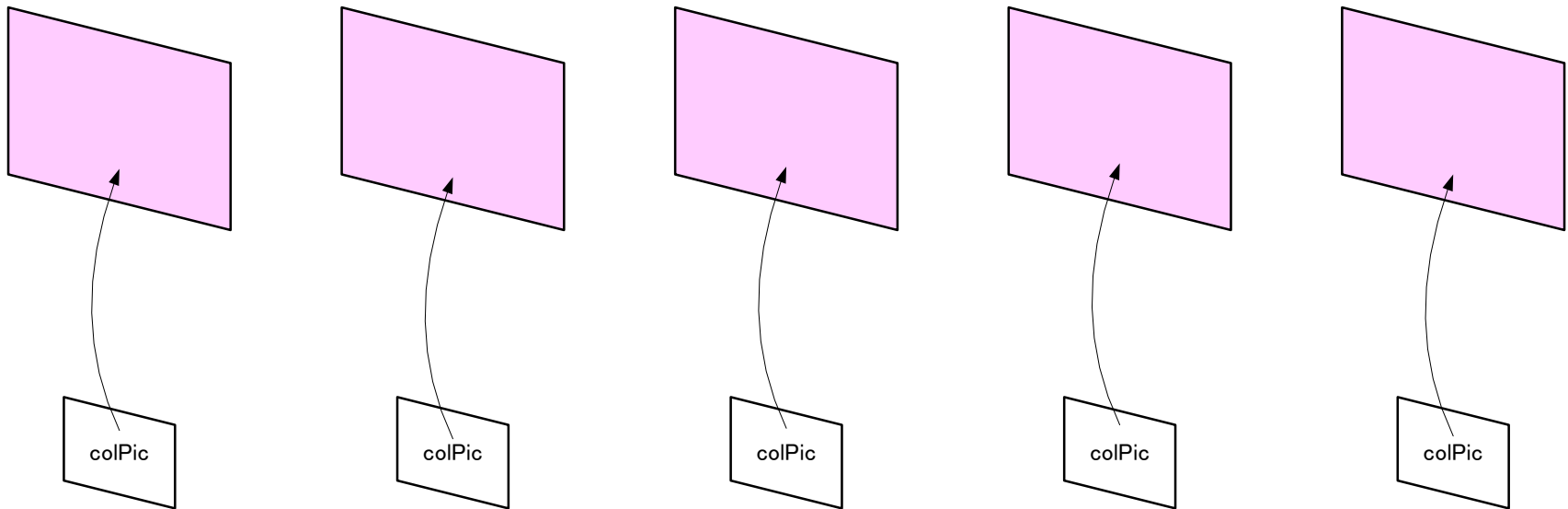
1. Motivation

- sps_temporal_mvp_enabled_flag
 - clarifies following conditions with regard to temporal MVP in sequence level
 - a) No temporal MVP
 - b) Enabled temporal MVP from reference layer or the same layer
 - does not clarify following conditions with regard to temporal MVP in sequence level
 - c) Enabled temporal MVP from only reference layer
 - d) Enabled temporal MVP from only the same layer

If these conditions are clarified, some real-time decoders may not need to prepare unused motion fields or keep them in such cases.

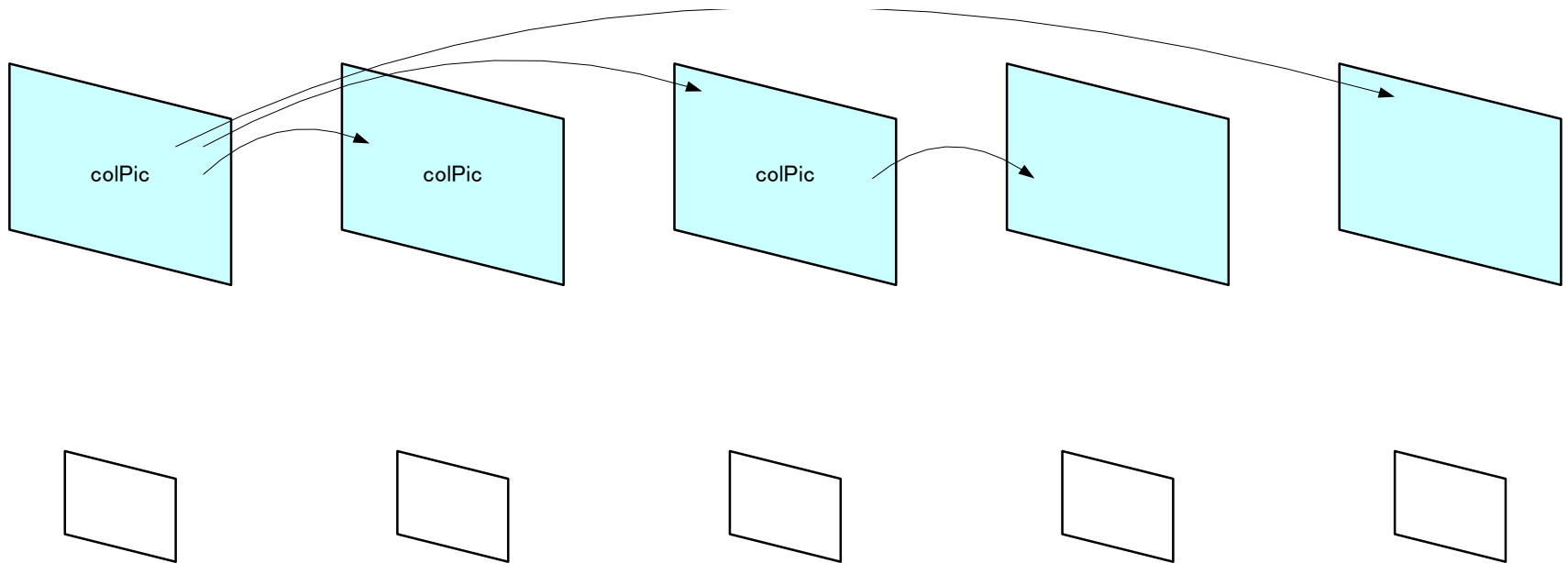
temporal motion vector from only reference layer

- don't need to keep motion fields of pictures in the same layer



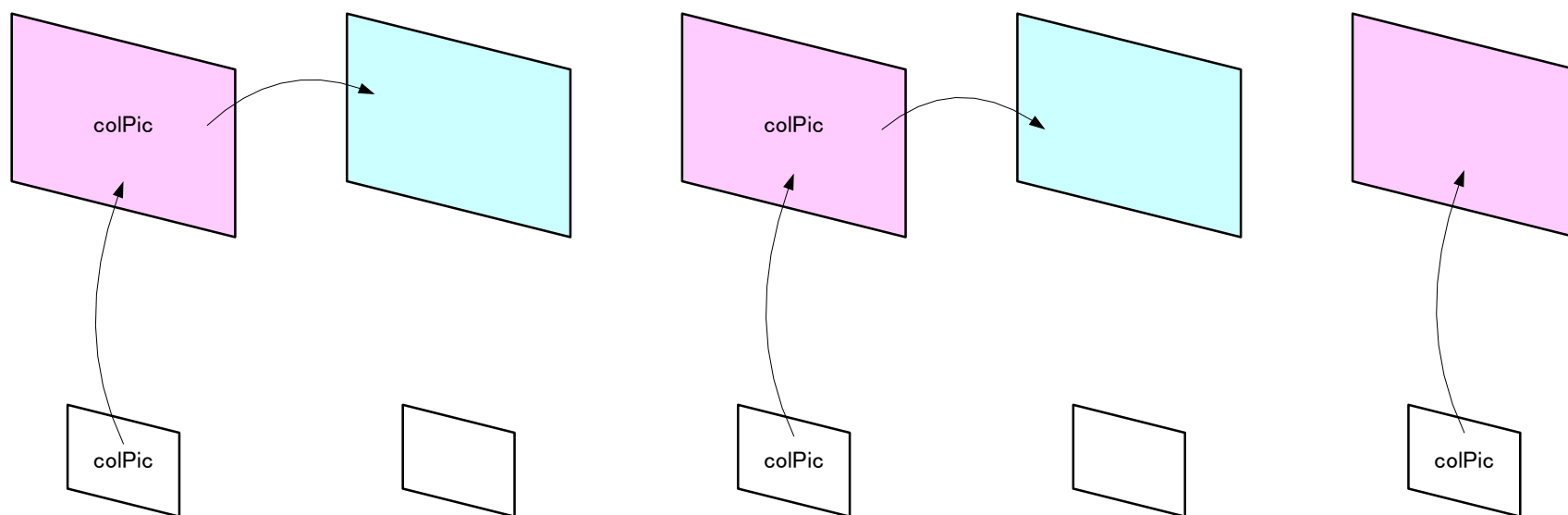
temporal motion vector from only the same layer

- don't need to resample motion fields of pictures in reference layer



temporal motion vector from reference layer and the same layer

- resample motion fields of pictures in reference view and keep motion fields of pictures in the same layer



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2. Proposals

Proposal 1

- add a syntax element **sps_alt_collocated_indication** in SPS extension.

0: Enabled temporal MVP from only reference layer
1: Enabled temporal MVP from only the same layer
2: Enabled temporal MVP from reference layer or the same layer

| sps_extension() { | Descriptor |
|---|------------|
| inter_view_mv_vert_constraint_flag | u(1) |
| sps_extension_vui_parameters() | |
| if(sps_temporal_mvp_enabled_flag) { | |
| sps_alt_collocated_indication | |
| } | |
| . . . | |

| slice_segment_headers() { | Descriptor |
|--|------------|
| . . . | |
| if(slice_temporal_mvp_enabled_flag) { | |
| if(nuh_layer_id > 0 && NumActiveMotionPredRefLayers > 0 | |
| && sps_alt_collocated_indication == 2) | |
| slice_alt_collocated_indication_flag | u(1) |
| if(slice_alt_collocated_indication_flag) | |
| if(NumActiveMotionPredRefLayers > 1) | |
| collocated_ref_layer_idx | ue(v) |
| else { | |
| . . . | |

Proposal 2

- add syntax elements **sps_alt_collocated_indication_fixed_flag** and **sps_alt_collocated_indication_flag** in SPS extension.
0: Enabled temporal MVP from only reference layer
1: Enabled temporal MVP from only the same layer

| | Descriptor |
|--|------------|
| sps_extension() { | |
| inter_view_mv_vert_constraint_flag | u(1) |
| sps_extension_vui_parameters() | |
| if(sps_temporal_mvp_enabled_flag) { | |
| sps_alt_collocated_indication_fixed_flag | |
| if(sps_alt_collocated_indication_fixed_flag) { | |
| sps_alt_collocated_indication_flag | |
| } | |
| } | |
| . . . | |

| | Descriptor |
|--|------------|
| slice_segment_header() { | |
| . . . | |
| if(slice_temporal_mvp_enabled_flag) { | |
| if(nuh_layer_id > 0 && NumActiveMotionPredRefLayers > 0 | |
| && !sps_alt_collocated_indication_fixed_flag) | |
| slice_alt_collocated_indication_flag | u(1) |
| if(slice_alt_collocated_indication_flag) | |
| if(NumActiveMotionPredRefLayers > 1) | |
| collocated_ref_layer_idx | ue(v) |
| else { | |
| . . . | |

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3. Conclusion

- This contribution proposes to add the syntax element to distinguish the conditions for temporal motion vector prediction in sequence level along with alt_collocated_indication_flag in slice level.
- It is recommended that this proposal be adopted into SHVC Working Draft and MV-HEVC Draft Text and SHM and MV-HEVC.