**INTERNATIONAL ORGANISATION FOR STANDARDISATION**

**ORGANISATION INTERNATIONALE DE NORMALISATION**

**ISO/IEC JTC1/SC29/WG11**

**CODING OF MOVING PICTURES AND AUDIO**

**ISO/IEC JTC1/SC29/WG11 MPEG2019/m51004**

**October 2019, Geneva, CH**

|  |  |
| --- | --- |
| **Source** | Samsung Electronics |
| **Status** | Input contribution |
| **Title** | [V-PCC] Signalling pixel deinterleaving flag for each map |
| **Author** | Rajan Joshi and Madhukar Budagavi |

# Introduction

During the 127th MPEG meeting in Gothenburg, Sweden, it was proposed in [1] that for point local reconstruction, a flag (plri\_point\_local\_reconstruction\_map\_enabled\_flag[ i ]) should be signalled for each map index to specify whether point local reconstruction is enabled for that map. The proposal was adopted and it was also decided that the specification should support the application of point local reconstruction and pixel deinterleaving tools for an arbitrary number of maps. The actual application of these tools should be restricted through profile restrictions to vpcc\_map\_count\_minus1 equal to 0.

To enable the pixel deinterleaving tool for an arbitrary number of maps, we propose signalling a similar flag ( asps\_pixel\_deinterleaving\_map\_flag[ i ] ) for every map to specify whether pixel deinterleaving is applied to map index i, where i = 0..vpcc\_map\_count\_minus1.

The specification changes are as follows

# Specification changes

#### 7.3.6.1 Atlas sequence parameter set syntax

|  |  |
| --- | --- |
| atlas\_sequence\_parameter\_set( ) { | **Descriptor** |
| **…** |  |
| **asps\_remove\_duplicate\_point\_enabled\_flag** | u(1) |
| **asps\_pixel\_deinterleaving\_flag** | u(1) |
| if( asps\_pixel\_deinterleaving\_flag ) |  |
| for( j = 0; j < = vpcc\_map\_count\_minus1; j+ +) |  |
| **asps\_pixel\_deinterleaving\_map\_flag[ j ]** | u(1) |
| **asps\_patch\_precedence\_order\_flag** | u(1) |
| **…** | u(1) |
| } |  |

#### 7.4.6.1 Atlas sequence parameter set RBSP semantics

**…**

**asps\_pixel\_deinterleaving\_flag** equal to 1 indicates that the decoded geometry and attribute videos for the current atlas contain spatially interleaved pixels from two maps. asps\_pixel\_deinterleaving\_flag equal to 0 indicates that the decoded geometry and attribute videos corresponding to the current atlas contain pixels from only a single map.

[Ed. (AMT): What is the interaction of this with vpcc\_map\_count\_minus1, vpcc\_multiple\_map\_streams\_present\_flag, and vpcc\_map\_absolute\_coding\_enabled\_flag? Should this not be present when vpcc\_map\_count\_minus1 is 0? What about vpcc\_map\_count\_minus1> 1? Would we then divide by two (in which case only even number of maps should be used)? Should also all maps be absolute encoded in this case? We likely would need to move this higher btw to deal with the interactions more elegantly]

[Ed. (AMT): Should this explicitly mention "corresponding to a single video frame" instead of single stream? Note also that even the 0 case definition seems problematic since it talks about a single stream and a single map. This basically cancels the definition of vpcc\_multiple\_map\_streams\_present\_flag = 0]

[Ed. (ATA): Currently, CTC & the SW does not support more than 2 maps]

[Ed. (RJ): Currently the flag makes sense only when vpcc\_map\_count\_minus1 is equal to 0. In that case, the semantics seem ok. According to the Gothenburg decision, the text should be generalized to arbitrary number of maps and the restriction to two layers should be in profiles. In such a case, similar to the PLR case, there would be one flag indicating whether the geomtery and attribute videos correpsonding to each map is actually an interleaving of two maps. But this needs a new contribution.]

**asps\_pixel\_deinterleaving\_map\_flag**[ j ] equal to 1 indicates that the decoded geometry and attribute videos for map index j for the current atlas contain spatially interleaved pixels from two maps. asps\_pixel\_deinterleaving\_map\_flag[ j ] equal to 0 indicates that the decoded geometry and attribute videos corresponding to map index j from the current atlas contain pixels from only a single map.

**asps\_patch\_precedence\_order\_flag** equal to 1 indicates that patch precedence for the current atlas is the same as the decoding order. asps\_patch\_precedence\_order\_flag equal to 0 indicates that patch precedence for the current atlas is the reverse of the decoding order.

…

### 9.4.3 Reconstruction of points for non-raw intra and inter coded patches when both asps\_pixel\_deinterleaving\_flag and plr\_point\_local\_reconstruction\_map\_enabled\_flag are 0

…

* The variable PointCnt is incremented by 1.
* If asps\_pixel\_deinterleaving\_map\_flag[ mapIdx ] is equal to 1, clause 9.4.1 is invoked (specify inputs and outputs).
* Otherwise if plr\_point\_local\_reconstruction\_map\_enabled\_flag[ mapIdx ] is equal to 1, clause 9.4.2 is invoked (specify inputs and outputs).

…

# References

[1] Julien Ricard, Celine Guede, Joan Llach, Yannick Olivier, and Jean-Claude Chevet, "[VPCC][specification] Syntax updates for PLR", ISO/IEC JTC1/SC29/WG11 m49233, July 2019, Gothenburg, Sweden