Suggested texts for Tickets 347, 356, 366, 434, 441, 443, 463, 471 and 483 on I_PCM (JCTVC-I0034)

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List of editorial issues related to I_PCM

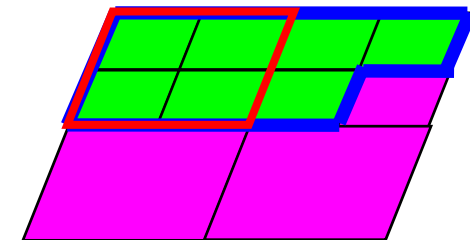| Clause	Editorial issues	Related Tickets and Ballot comments
7.3.7.2 PCM sample syntax	Non-break hyphen is used instead of minus. ~~# of chroma samples is wrong.~~	Ticket 347 ~~JP 29~~
7.4.2.1 SPS semantics	Inconsistent name. Incorrect requirement in log2_min_pcm_coding _block_size_minus3	Ticket 443 JP 34
7.4.6 Semantics of pcm_flag and num_subsequent_pcm	Clarified in this presentation	Ticket 356/366/434/471 JP 42/43
7.4.8 Semantics of split_trans form_flag	Clarified in this presentation	Ticket 483
8.4 Decoding process for coding units coded in intra prediction mode	Cr sample location is wrong due to typo in e.q. (8-18).	JP 47
8.7.1.4 Filtering process for coding unit	Qp setting for I_PCM luma and chroma is wrong.	Ticket 463 JP 67/71
8.7.1.4.5/8.7.1.4.6/8.7.2.1.1	Editor note "how can we know a sample is coded by I_PCM mode?".	NA

Issues in semantics of pcm_flag and num_subsequent_pcm

- Intra prediction mode is not defined in I_PCM regions (JCTVC-I0033)
- Inference of pcm_flag is described in the semantics of num_subsecuent_pcm
- Meaning of subsequent I_PCM coding units is a little bit ambiguous

pcm_flag specifies whether the associated coding unit with PART_2Nx2N is coded by I_PCM: If the pcm_flag is equal to 1, the associated coding unit with PART_2Nx2N is coded by I_PCM. When the pcm_flag is not present, it shall be inferred to be equal to 0.

num_subsequent_pcm specifies the number of subsequent I_PCM coding units with the current log2CbSize that successively follow the current I_PCM coding unit in the same depth of a TB. The values of pcm_flags of the subsequent coding units are set equal to 1. It is a requirement of bitstream conformance that the immediate roots of the current and subsequent I_PCM coding units are identical. The value num_subsequent_pcm shall be in the range of 0 to 3, inclusive.
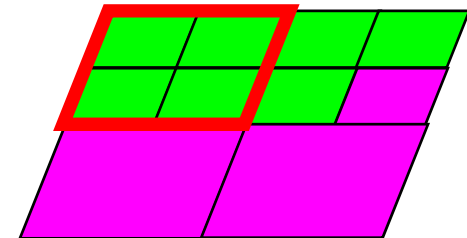
□ I_PCM

□ Non I_PCM

Suggested fix

- Define Intra prediction mode in I_PCM regions
- Inference of pcm_flag is described in the same semantics.
- Precise description of subsequent I_PCM coding units

pcm_flag specifies whether the associated coding unit with PART_2Nx2N is coded by I_PCM: If the pcm_flag is equal to 1, the associated coding unit with PART_2Nx2N is coded by I_PCM and its intra prediction modes for luma and chroma samples are set equal to Intra_DC. When the pcm_flag is not present, it shall be inferred as follows: If NumPCMBlock is equal to 0, it shall be inferred to be equal to 0; otherwise, it shall be inferred to be equal to 1.

num_subsequent_pcm specifies the number of subsequent PART_2Nx2N coding units coded by I_PCM with the current log2CbSize that share the same parent node as the current I_PCM coding unit and successively follow the current I_PCM coding unit in decoding order. The value num_subsequent_pcm shall be in the range of 0 to 3, inclusive.

■ I_PCM

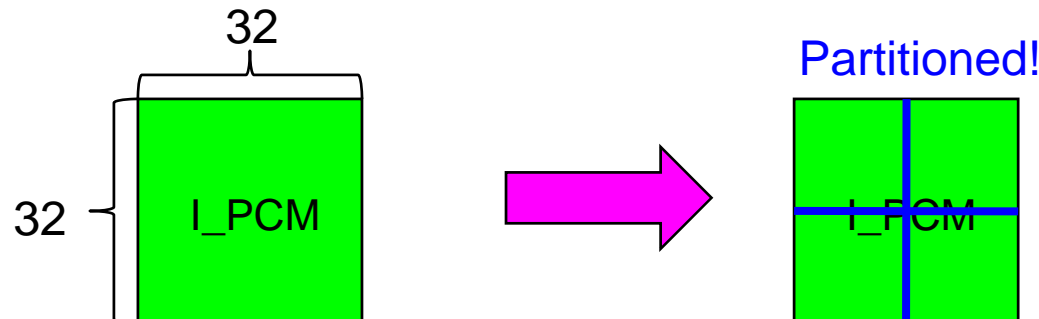■ Non I_PCM

Issues in semantics of split_transform_flag

● I_PCM block is partitioned when its size is larger than Log2MaxTrafoSize

split_transform_flag[x0][y0][trafoDepth] specifies whether a block is split into four blocks with smaller horizontal or vertical size for the purpose of transform coding. The array indices x0, y0 specify the location (x0, y0) of the top-left luma sample of the considered block relative to the top-left luma sample of the picture. The array index trafoDepth specifies the current subdivision level of a coding unit into blocks for the purpose of transform coding. trafoDepth is equal to 0 for blocks that correspond to coding units.

When split_transform_flag[x0][y0][trafoDepth] is not present, it is inferred as follows:

- If log2TrafoSize is greater than Log2MaxTrafoSize or intraSplitFlag is equal to 1 or interSplitFlag is equal to 1, the value of split_transform_flag[x0][y0][trafoDepth] is inferred to be equal to 1.

- Otherwise (log2TrafoSize is less than or equal to Log2MaxTrafoSize, intraSplitFlag is equal to 0 and interSplitFlag is equal to 0), the value of split_transform_flag[x0][y0][trafoDepth] is inferred to be equal to 0.

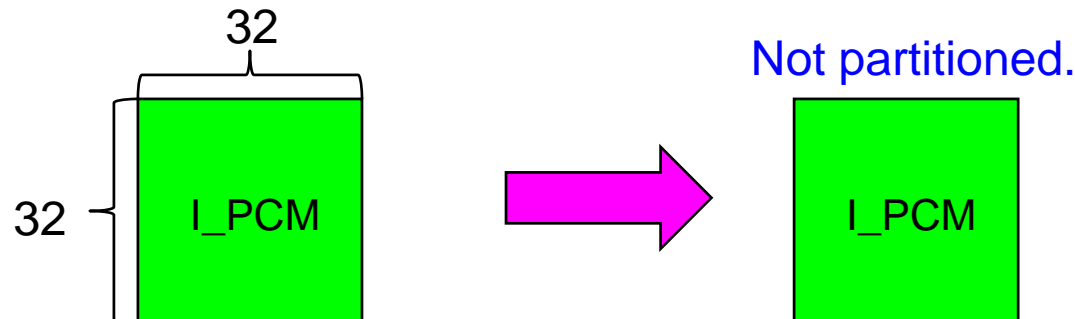Example) I_PCM is 32x32 and MaxTrafoSize=16x16

Suggested fix

● Add a condition for split_tranform_flag inference for I_PCM

split_transform_flag[x0][y0][trafoDepth] specifies whether a block is split into four blocks with smaller horizontal or vertical size for the purpose of transform coding. The array indices x0, y0 specify the location (x0, y0) of the top-left luma sample of the considered block relative to the top-left luma sample of the picture. The array index trafoDepth specifies the current subdivision level of a coding unit into blocks for the purpose of transform coding. trafoDepth is equal to 0 for blocks that correspond to coding units.
When split_transform_flag[x0][y0][trafoDepth] is not present, it is inferred as follows:
- If pcm_flag is equal to 1, the value of split_transform_flag[x0][y0][trafoDepth] is inferred to be equal to 0.
- Otherwise, if log2TrafoSize is greater than Log2MaxTrafoSize or intraSplitFlag is equal to 1 or interSplitFlag is equal to 1, the value of split_transform_flag[x0][y0][trafoDepth] is inferred to be equal to 1.
- Otherwise (pcm_flag is equal to 0, log2TrafoSize is less than or equal to Log2MaxTrafoSize, intraSplitFlag is equal to 0 and interSplitFlag is equal to 0), the value of split_transform_flag[x0][y0][trafoDepth] is inferred to be equal to 0.

Example) I_PCM is 32x32 and MaxTrafoSize=16x16

32

32

I_PCM

Not partitioned.

I_PCM

Conclusion

● Revisions of JCTVC-I0034 or equivalent ones are reflected onto the DIS text.

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