

**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	<b>Clarified in this presentation</b>	Ticket 356/366/434/471 JP 42/43
7.4.8 Semantics of split_transform_flag	<b>Clarified in this presentation</b>	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



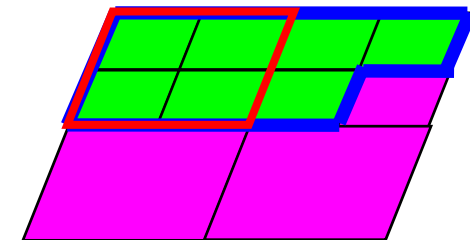
# Issues in semantics of pcm\_flag and num\_subsequent\_pcm

- Intra prediction mode is not defined in I\_PCM regions (JCTVC-I0033)
- Inference of pcm\_flag is described in the semantics of num\_subsequent\_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



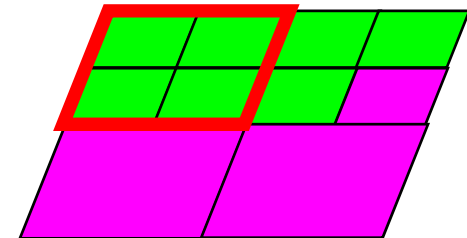
# Suggested fix

- 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

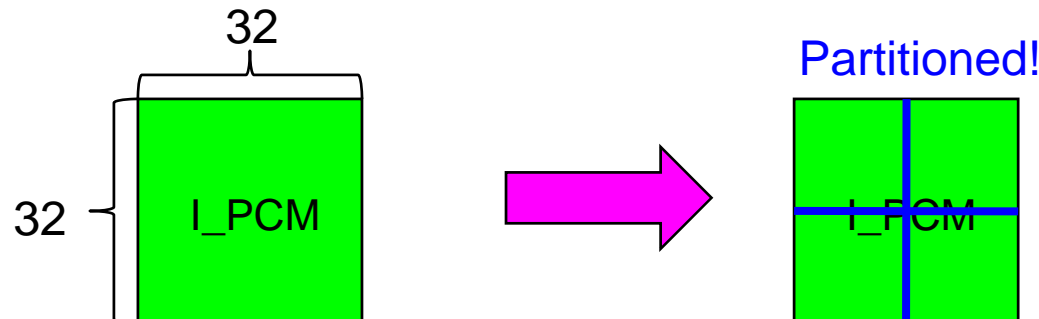
- I\_PCM block is partitioned when its size is larger than Log2MaxTrafoSize

**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

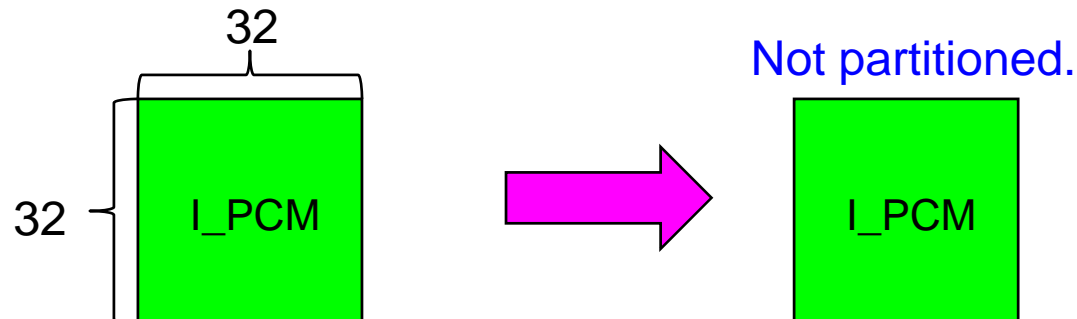
- Add a condition for split\_tranform\_flag inference for I\_PCM

**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



# Conclusion

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

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