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| **Joint Collaborative Team on 3D Video Coding Extensions**  **of ITU-T SG 16 WP 3 and ISO/IEC JTC 1/SC 29/WG 11**  9th Meeting: Sapporo, JP, 3 – 9 July 2014 | Document: JCT3V-J0049 |

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| *Title:* | **Restriction of large-sized DMM** | | |
| *Status:* | Input Document | | |
| *Purpose:* | Proposal | | |
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| *Source:* | LG Electronics | | |

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The newly added parts compared to 3D-HEVC working draft 3 are highlighted in green and the removed parts are marked with ~~strikethrough~~.

**I.7.3.8.5.1 Intra mode extension syntax**

|  |  |
| --- | --- |
| intra\_mode\_ext( x0 , y0 , log2PbSize ) { | **Descriptor** |
| if( log2PbSize <= ~~6~~ Log2MaxTrafoSize ) |  |
| **dim\_not\_present\_flag**[ x0 ][ y0 ] | ae(v) |
| if ( !dim\_not\_present\_flag[ x0 ][ y0 ]  ) |  |
| **depth\_intra\_mode\_flag**[ x0 ][ y0 ] | ae(v) |
| if( DepthIntraMode[ x0 ][ y0 ] = = INTRA\_DEP\_DMM\_WFULL ) |  |
| **wedge\_full\_tab\_idx**[ x0  ][ y0 ] | ae(v) |
| } |  |

**I.7.4.9.5.1 Intra mode extension semantics**

**dim\_not\_present\_flag**[ x0 ][ y0 ] equal to 1 specifies that the depth\_intra\_mode\_flag syntax element is not present and that intra modes with intraPredMode in the range of 0 to 34 is used for the current prediction unit. dim\_not\_present\_flag[ x0 ][ y0 ] equal to 0 specifies that that the depth\_intra\_mode\_flag syntax element might be present. When not present, the value of dim\_not\_present\_flag[ x0 ][ y0 ] is inferred to be equal to 1.

~~When log2CbSize is greater than Log2MaxTrafoSize and sdc\_flag[ x0 ][ y0 ] is equal to 0, the value of dim\_not\_present\_flag[ x0 ][ y0 ] shall be equal to 1.~~

For x = x0..x0 + (1 << log2PbSize) − 1, y = y0..y0 + (1 << log2PbSize) − 1, the variable DmmFlag[ x ][ y ] is derived as specified in the following:

DmmFlag[ x ][ y ] = !dim\_not\_present\_flag[ x0 ][ y0 ] (‑31)

**depth\_intra\_mode\_flag**[ x0 ][ y0 ] is used to specify the depth intra mode of the current prediction unit.

When dmm\_cpredtex\_flag[ nuh\_layer\_id ] is equal to 0 or nal\_unit\_type is equal to BLA\_W\_LP, BLA\_W\_RADL, BLA\_N\_LP, IDR\_W\_RADL or IDR\_N\_LP, it is a requirement of bitstream conformance, that depth\_intra\_mode\_flag is equal to 0.

The variable DepthIntraMode[ x0 ][ y0 ] is derived as specified in the following:

DepthIntraMode[ x0 ][ y0 ] = dim\_not\_present\_flag[ x0 ][ y0 ] ? −1 : depth\_intra\_mode\_flag[ x0 ][ y0 ] (‑32)

specifies the value for the depth intra mode and the associated names.

**Table ‑4 – Specification of DepthIntraMode and associated name**

|  |  |
| --- | --- |
| **DepthIntraMode** | **Associated name** |
| −1 | INTRA\_DEP\_NONE |
| 0 | INTRA\_DEP\_DMM\_WFULL |
| 1 | INTRA\_DEP\_DMM\_CPREDTEX |

**wedge\_full\_tab\_idx**[ x0 ][ y0 ]specifies the index of the wedgelet pattern in the corresponding pattern list when DepthIntraMode[ x0 ][ y0 ] is equal to INTRA\_DEP\_DMM\_WFULL.

**I.8.4.4.1 General decoding process for intra blocks**

Inputs to this process are:

a sample location ( xTb0, yTb0 ) specifying the top-left sample of the current transform block relative to the top‑left sample of the current picture,

a variable log2TrafoSize specifying the size of the current transform block,

a variable trafoDepth specifying the hierarchy depth of the current block relative to the coding unit,

a variable predModeIntra specifying the intra prediction mode,

a variable cIdx specifying the colour component of the current block.

Output of this process is a modified reconstructed picture before deblocking filtering.

The luma sample location ( xTbY, yTbY ) specifying the top-left sample of the current luma transform block relative to the top-left luma sample of the current picture is derived as follows:

( xTbY, yTbY ) = ( cIdx  = =  0 ) ? ( xTb0, yTb0 ) : ( xTb0 \* SubWidthC, yTb0 \* SubHeightC ) (I‑53)

The variable splitFlag is derived as follows:

If SdcFlag[ xTbY ][ yTbY ] is equal to 1, the following applies:

splitFlag = ~~!DmmFlag[ xTbY ][ yTbY ] && (~~ log2TrafoSize > Log2MaxTrafoSize ~~)~~ (I‑54)

otherwise, if single\_depth\_mode\_flag[ xTbY ][ yTbY ] is equal to 1, splitFlag is set equal to 0.

otherwise, if cIdx is equal to 0, splitFlag is set equal to split\_transform\_flag[ xTbY ][ yTbY ][ trafoDepth ].

Otherwise, if all of the following conditions are true, splitFlag is set equal to 1.

cIdx is greater than 0

split\_transform\_flag[ xTbY ][ yTbY ][ trafoDepth ] is equal to 1

log2TrafoSize is greater than 2

Otherwise, splitFlag is set equal to 0.

Depending on the value of splitFlag, the following applies:

If splitFlag is equal to 1, the following ordered steps apply:

* 1. The variables xTb1 and yTb1 are derived as follows:

If either cIdx is equal to 0 or ChromaArrayType is not equal to 2, the following applies:

The variable xTb1 is set equal to xTb0 + ( 1  <<  ( log2TrafoSize − 1 ) ).

The variable yTb1 is set equal to yTb0 + ( 1  <<  ( log2TrafoSize − 1 ) ).

* + Otherwise (ChromaArrayType is equal to 2 and cIdx is greater than 0), the following applies:
  + The variable xTb1 is set equal to xTb0 + ( 1  <<  ( log2TrafoSize − 1 ) ).
  + The variable yTb1 is set equal to yTb0 + ( 2  <<  ( log2TrafoSize − 1 ) ).
  1. The general decoding process for intra blocks as specified in this subclause is invoked with the location ( xTb0, yTb0 ), the variable log2TrafoSize set equal to log2TrafoSize − 1, the variable trafoDepth set equal to trafoDepth + 1, the intra prediction mode predModeIntra, and the variable cIdx as inputs, and the output is a modified reconstructed picture before deblocking filtering.
  2. The general decoding process for intra blocks as specified in this subclause is invoked with the location ( xTb1, yTb0 ), the variable log2TrafoSize set equal to log2TrafoSize − 1, the variable trafoDepth set equal to trafoDepth + 1, the intra prediction mode predModeIntra, and the variable cIdx as inputs, and the output is a modified reconstructed picture before deblocking filtering.
  3. The general decoding process for intra blocks as specified in this subclause is invoked with the location ( xTb0, yTb1 ), the variable log2TrafoSize set equal to log2TrafoSize − 1, the variable trafoDepth set equal to trafoDepth + 1, the intra prediction mode predModeIntra, and the variable cIdx as inputs, and the output is a modified reconstructed picture before deblocking filtering.
  4. The general decoding process for intra blocks as specified in this subclause is invoked with the location ( xTb1, yTb1 ), the variable log2TrafoSize set equal to log2TrafoSize − 1, the variable trafoDepth set equal to trafoDepth + 1, the intra prediction mode predModeIntra, and the variable cIdx as inputs, and the output is a modified reconstructed picture before deblocking filtering.

Otherwise (splitFlag is equal to 0), for the variable blkIdx proceeding over the values 0..( cIdx > 0  &&  ChromaArrayType  = =  2 ? 1 : 0 ), the following ordered steps apply:

* 1. The variable nTbS is set equal to 1  <<  log2TrafoSize.

The variable yTbOffset is set equal to blkIdx \* nTbS.

The variable yTbOffsetY is set equal to yTbOffset \* SubHeightC.

The variable residualDpcm is derived as follows:

If all of the following conditions are true, residualDpcm is set equal to 1.

implicit\_rdpcm\_enabled\_flag is equal to 1.

either transform\_skip\_flag[ xTbY ][ yTbY + yTbOffsetY ][ cIdx ] is equal to 1, or cu\_transquant\_bypass\_flag is equal to 1.

either predModeIntra is equal to 10, or predModeIntra is equal to 26.

Otherwise, residualDpcm is set equal to explicit\_rdpcm\_flag[ xTbY ][ yTbY + yTbOffsetY ][ cIdx ].

The general intra sample prediction process as specified in subclause I.8.4.4.2.1 is invoked with the transform block location ( xTb0, yTb0 + yTbOffset ), the intra prediction mode predModeIntra, the transform block size nTbS, and the variable cIdx as inputs, and the output is an (nTbS)x(nTbS) array predSamples.

The variable residualFlag is set equal to !( single\_sample\_flag[ xTb0 ][ xTb0 ]  | |  SdcFlag[ xTb0 ][ xTb0 ]) and depending on residualFlag, the following applies:

If residualFlag is equal to 1, the following applies:

The scaling and transformation process as specified in subclause 8.6.2 is invoked with the luma location ( xTbY, yTbY + yTbOffsetY ), the variable trafoDepth, the variable cIdx, and the transform size trafoSize set equal to nTbS as inputs, and the output is an (nTbS)x(nTbS) array resSamples.

When residualDpcm is equal to 1, the directional residual modification process for blocks using a transform bypass as specified in subclause 8.6.5 is invoked with the variable mDir set equal to predModeIntra / 26, the variable nTbS, and the (nTbS)x(nTbS) array r set equal to the array resSamples as inputs, and the output is a modified (nTbS)x(nTbS) array resSamples.

When cross\_component\_prediction\_enabled\_flag is equal to 1, ChromaArrayType is equal to 3, and cIdx is not equal to 0, the residual modification process for transform blocks using cross-component prediction as specified in subclause 8.6.6 is invoked with the current luma transform block location ( xTbY, yTbY ), the variable nTbS, the variable cIdx, the (nTbS)x(nTbS) array rY set equal to the corresponding luma residual sample array resSamples of the current transform block, and the (nTbS)x(nTbS) array r set equal to the array resSamples as inputs, and the output is a modified (nTbS)x(nTbS) array resSamples.

Otherwise (residualFlag is equal to 0), for x, y = 0..nTbS − 1, resSamples[ x ][ y ] is set equal to 0.

The picture construction process prior to in-loop filtering for a colour component as specified in subclause 8.6.7 is invoked with the transform block location ( xTb0, yTb0 + yTbOffset ), the variables nCurrSw and nCurrSh both set equal to nTbS, the variable cIdx, the (nTbS)x(nTbS) array predSamples, and the (nTbS)x(nTbS) array resSamples as inputs.

When trafoDepth is equal to 0, SdcFlag[ xTb0 ][ yTb0 ] is equal to 1 and DmmFlag[ xTb0 ][ yTb0 ] is equal to 0, the depth offset assignment process as specified in subclause I.8.4.4.3 is invoked with the location ( xTb0, yTb0 ), and the transform size trafoSize set equal to nTbS as inputs.