**Proposed Specification for Working Draft (1)**

##### Specification of Intra\_FromLuma prediction mode

Inputs to this process are:

– a sample location ( xB, yB ) specifying the top-left sample of the current block relative to the top‑left sample of the current picture,

– neighbouring samples p[ x, y ], with x, y = −1..2\*nS−1,

– a variable nS specifying the prediction size.

Output of this process is:

– predicted samples predSamples[ x, y ], with x, y =0..nS−1.

This intra prediction mode is invoked when intraPredMode is equal to 35.

The values of the prediction samples predSamples[ x, y ], with x, y = 0..nS−1, are derived as the following ordered steps:

1. Variable k3 and the sample array pY’ are derived as:

k3 = Max( 0, BitDepthC + Log2( nS ) − 14 ) (8‑58)

pY’[ x, −1 ] = ( PLM[ 2x−1, −1 ] + 2\*PLM[ 2x, −1 ] + PLM[ 2x+1, −1 ] + 2 ) >> 2, with x = 0..nS−1 (8‑59)

pY’[ −1, y ] = ( PLM[ −1, 2y ] + PLM[ −1, 2y+1 ] ) >> 1, with y = 0..nS−1 (8‑60)

pY’[ x, y ] = ( recSamplesL[ 2x, 2y ] + recSamplesL[ 2x, 2y+1 ] ) >> 1, with x, y = 0..nS−1 (8‑61)

1. Variables L, C, LL, LC and k2 are derived as follows:

L =  (8‑62)

C =  (8‑63)

LL =  (8‑64)

LC =  (8‑65)

k2 = Log2( (2\*nS) >> k3 ) (8‑66)

1. Variables a, b and k are derived as:

a1 = ( LC << k2 ) – L\*C (8‑67)  
a2 = ( LL << k2 ) – L\*L (8‑68)  
k1 = Max( 0, Log2( abs( a2 ) ) − 5 ) – Max( 0, Log2( abs( a1 ) ) − (BitDepthC-2) ) ~~+ 2~~ (8‑69)  
a1s = a1 >> Max(0, Log2( abs( a1 ) ) − (BitDepthC – 2) ) (8‑70)  
a2s = abs( a2 >> Max(0, Log2( abs( a2 ) ) − 5 ) ) (8‑71)  
a3 = a2s < 1 ? 0 : Clip3( −215, 215−1, a1s\*lmDiv + ( 1 << ( k1 − 1 ) ) >> k1 ) (8‑72)

a = a3 >> Max( 0, Log2( abs( a3 ) ) − 6 ) (8‑73)  
k = BitDepthC – 1  – Max( 0, Log2( abs( a ) ) − 6 ) (8‑74)

b = ( L – ( ( a\*C ) >> k1 ) + ( 1 << ( k2 − 1 ) ) ) >> k2 (8‑75)

where lmDiv is specified in with the input a2s.

1. The values of the prediction samples predSamples[ x, y ] are derived as:

predSamples[ x, y ] = Clip1C( ( ( pY’[ x, y ] \* a ) >> k ) + b ), with x, y = 0..nS−1 (8‑76)

Table 8‑7 – Specification of lmDiv

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| a2s | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| lmDiv | 512 | 256 | 171 | 128 | 102 | 85 | 73 | 64 | 57 | 51 | 47 | 43 | 39 | 37 | 34 | 32 |
| a2s | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| lmDiv | 30 | 28 | 27 | 26 | 24 | 23 | 22 | 21 | 20 | 20 | 19 | 18 | 18 | 17 | 17 | 16 |
| a2s | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| lmDiv | 16 | 15 | 15 | 14 | 14 | 13 | 13 | 13 | 12 | 12 | 12 | 12 | 11 | 11 | 11 | 11 |
| a2s | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 |  |
| lmDiv | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 8 | 8 |  |

**Proposed Specification for Working Draft (2)**

##### Specification of Intra\_FromLuma prediction mode

Inputs to this process are:

– a sample location ( xB, yB ) specifying the top-left sample of the current block relative to the top‑left sample of the current picture,

– neighbouring samples p[ x, y ], with x, y = −1..2\*nS−1,

– a variable nS specifying the prediction size.

Output of this process is:

– predicted samples predSamples[ x, y ], with x, y =0..nS−1.

This intra prediction mode is invoked when intraPredMode is equal to 35.

The values of the prediction samples predSamples[ x, y ], with x, y = 0..nS−1, are derived as the following ordered steps:

1. Variable k3 and the sample array pY’ are derived as:

k3 = Max( 0, BitDepthC + Log2( nS ) − 14 ) (8‑58)

pY’[ x, −1 ] = ( PLM[ 2x−1, −1 ] + 2\*PLM[ 2x, −1 ] + PLM[ 2x+1, −1 ] + 2 ) >> 2, with x = 0..nS−1 (8‑59)

pY’[ −1, y ] = ( PLM[ −1, 2y ] + PLM[ −1, 2y+1 ] ) >> 1, with y = 0..nS−1 (8‑60)

pY’[ x, y ] = ( recSamplesL[ 2x, 2y ] + recSamplesL[ 2x, 2y+1 ] ) >> 1, with x, y = 0..nS−1 (8‑61)

1. Variables L, C, LL, LC and k2 are derived as follows:

L =  (8‑62)

C =  (8‑63)

LL =  (8‑64)

LC =  (8‑65)

k2 = Log2( (2\*nS) >> k3 ) (8‑66)

1. Variables a, b and k are derived as:

a1 = ( LC << k2 ) – L\*C (8‑67)  
a2 = ( LL << k2 ) – L\*L (8‑68)  
k1 = Max( 0, Log2( abs( a2 ) ) − 5 ) – Max( 0, Log2( abs( a1 ) ) − (BitDepthC-2) ) ~~+ 2~~ (8‑69)  
a1s = a1 >> Max(0, Log2( abs( a1 ) ) − (BitDepthC – 2) ) (8‑70)  
a2s = abs( a2 >> Max(0, Log2( abs( a2 ) ) − 5 ) ) (8‑71)  
a3 = a2s < 32 ? 0 : Clip3( −215, 215−1, a1s\*lmDiv + ( 1 << ( k1 − 1 ) ) >> k1 ) (8‑72)

a = a3 >> Max( 0, Log2( abs( a3 ) ) − 6 ) (8‑73)  
k = BitDepthC +4  – Max( 0, Log2( abs( a ) ) − 6 ) (8‑74)

b = ( L – ( ( a\*C ) >> k1 ) + ( 1 << ( k2 − 1 ) ) ) >> k2 (8‑75)

where lmDiv is specified in with the input a2s.

1. The values of the prediction samples predSamples[ x, y ] are derived as:

predSamples[ x, y ] = Clip1C( ( ( pY’[ x, y ] \* a ) >> k ) + b ), with x, y = 0..nS−1 (8‑76)

Table 8‑7 – Specification of lmDiv

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| a2s | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 |
| lmDiv | 512 | 496 | 482 | 468 | 455 | 443 | 431 | 420 | 410 | 400 | 390 | 381 | 372 | 364 | 356 | 349 |
| a2s | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 |
| lmDiv | 341 | 334 | 328 | 321 | 315 | 309 | 303 | 298 | 293 | 287 | 282 | 278 | 273 | 269 | 264 | 260 |