

# **Intra mode parsing without access neighbouring information**

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# Introduction

- ❖ Intra mode parsing dependency on neighbor information
  - Luma intra directions
    - Need check 1MPM or 2MPM exist
    - Planar flag is coded after DC mode
  - Chroma intra directions
    - Context modeling for DM mode coding depends on neighbor intra mode
    - Total number of possible chroma intra modes is also depends on DM mode
- ❖ During parsing all above conditions should be checked and necessary information should be stored
- ❖ It is proposed to remove all checking and make independent parsing

# Proposed framework

- ❖ Unification for Planar mode coding
  - Include Planar mode in the scope of angular modes
  - Assign index 3 for Planar mode right after DC
- ❖ Use only 2 most probable modes for every luma intra direction coding
  - Resolve situation when two MPM modes are same
- ❖ Remove context dependency for chroma DM mode coding
  - Use only one context instead of current 3
- ❖ Remove dependency on DM for total possible chroma intra modes
  - Always use DM, LM, Ver, Hor, DC and Planar modes
  - No chroma codewords removing

# Unified Planar mode coding

- ❖ Planar mode was included into angular directions set
- ❖ Same angular mode coding method was applied for Planar mode

Mode index	Angular direction
0	Vertical
1	Horizontal
2	DC
3	Ver-8
4	Ver-4
...	
33	Hor+7

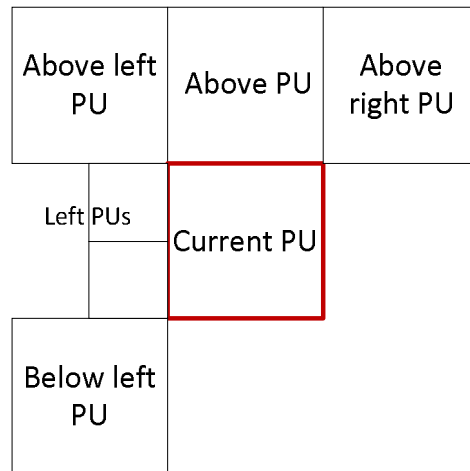
Planar

Mode index	Angular direction
0	Vertical
1	Horizontal
2	DC
3	Planar
4	Ver-8
5	Ver-4
...	
34	Hor+7

Test configuration	Unified Planar coding				
	Y	U	V	eTime	dTime
HE Intra	0.0	-0.2	-0.3	100%	100%
LC Intra	-0.1	-0.1	-0.1	100%	100%

# Always 2 most probable modes

- ❖ Most probable modes are taken from left and above neighbour PUs
- ❖ Default mode is assigned if left and above intra modes are same



First MPM intra direction		Second MPM assignment	
0	Vertical	2	Planar
1	Horizontal	2	Planar
2	DC	3	Planar
3	<b>Planar</b>	2	DC
4..34	Angular modes	2	Planar

- ❖ Neighbour dependency was removed for chroma intra mode coding

<i>Test configuration</i>	<i>Always 2MPM</i>				
	Y	U	V	eTime	dTime
HE Intra	0.0	0.0	0.0	100%	100%
LC Intra	-0.1	0.1	0.1	100%	100%

# Chroma coding modification

- ❖ Remove context dependency for chroma DM mode coding
  - Use only one context instead of current 3
- ❖ Remove dependency on DM for total possible chroma intra modes
  - Always use DM, LM, Ver, Hor, DC and Planar modes
  - No chroma codewords removing

intra_chroma pred mode	IntraPredMode[ xB ][ yB ] X ( 4 <= X < 35 )					Context index
0 (LM)	35	35	35	35	35	3
1 (Ver)	n/a	0	0	0	0	3
2 (Hor)	1	n/a	1	1	1	3
3 (DC/Planar)	2	2	2	2	2	3
4 (DM)	0	1	2	3	X	( leftChromaDir == DM ) + ( aboveChromaDir == DM )

intra_chroma_pred_m ode	IntraPredMode[ xB ] [ yB ] X ( 0 <= X < 35 )	Context index
0 (LM)	35	1
1 (Ver)	0	1
2 (Hor)	1	1
3 (DC)	2	1
4 (Planar)	3	1
5 (DM)	X	0



# Conclusions

- ❖ In this proposal, luma intra direction coding framework without access neighbouring information was proposed
  - Planar mode coding as one of the angular intra directions
  - Always two most probable modes are considered
  - Chroma intra mode coding
- ❖ Suggested framework provides less complexity for intra modes parsing and it is not necessary to check for neighbour intra directions at parsing stage.
- ❖ No loss are reported for both Intra HE and Intra LC configurations
- ❖ Based on the results, it is suggested to include proposed intra mode coding framework into HM.



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Thank you !