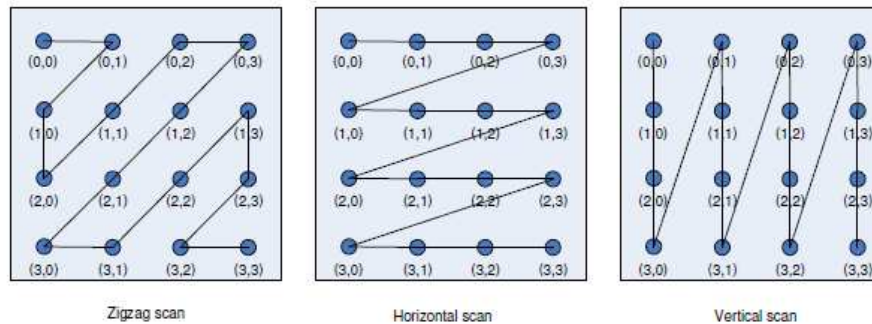# JCTVC-D393
CE11: Mode Dependent Coefficient Scanning

Y. Zheng, M. Coban, X. Wang, J. Sole, R. Joshi,, M. Karczewicz

Mode Dependent Coefficient Scanning (MDCS)

- Intra
- 3 scans
 - 0: zigzag
  - 1: horizontal
  - 2: vertical

Zigzag scan   Horizontal scan   Vertical scan

- 2 mapping tables

Luma

Mode \ TU	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
32x32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16x16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8x8	1	2	0	0	1	1	0	2	2	0	0	1	1	0	0	2	2	0	0	0	1	1	1	1	0	0	0	0	2	2	2	2	0	0
4x4	1	2	0	0	1	1	0	2	2	0	0	1	1	0	0	2	2	0	0	0	1	1	1	1	0	0	0	0	2	2	2	2	0	0
2x2																																		

Chroma

Mode \ TU	0	1	2	3	4
32x32					
16x16	0	0	0	0	luma
8x8	0	0	0	0	luma
4x4	1	2	0	0	luma
2x2	1	2	0	0	luma

- Scanning order selection depends on
  - TU size
  - Intra prediction mode
- JCTVC-D260 Significance map coding context support

D260

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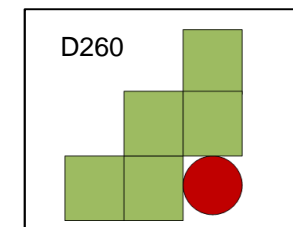
Results: MDCS (HE)

Configuration	MDCS		
	Y	U	V
HE Intra	-0.9	-1.1	-1.1
HE Random Access	-0.2	-0.2	-0.3
HE Low Delay	-0.1	-0.1	0.0

Anchor:TMuC0.9

Configuration	MDCS		
	Y	U	V
HE Intra	-1.2	-1.5	-1.6
HE Random Access	-0.5	-0.5	-0.6
HE Low Delay	-0.2	-0.1	-0.2

Anchor:TMuC0.9 (D239+D260)

Configuration	MDCS	
	Encoder	Decoder
HE Intra	100%	100%
HE Random Access	100%	101%
HE Low Delay	101%	100%

Complexity (PC)

Configuration	MDCS	
	Encoder	Decoder
HE Intra	96%	74%
HE Random Access	98%	80%
HE Low Delay	96%	79%

Complexity (cluster)

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Results: MDCS (LoCo)

Configuration	JCTVC-D374			JCTVC-D374+MDCS		
	Y	U	V	Y	U	V
LC Intra	-1.6	-1.1	-1.0	-2.1	-1.6	-1.6
LC Random Access	-0.6	-1.3	-1.3	-0.9	-1.4	-1.5
LC Low Delay	-0.1	-1.9	-2.0	-0.2	-1.9	-2.0

Anchor:TMuC0.9

Configuration	MDCS		
	Y	U	V
Loco Intra	-0.6	-0.5	-0.6
Loco RandomAccess	-0.3	-0.1	-0.2
Loco Low Delay	-0.1	-0.1	0.0

Anchor:TMuC0.9+JCTVC-D374

Configuration	MDCS	
	Encoder	Decoder
Loco Intra	101%	100%
Loco Random Access	100%	100%
Loco Low Delay	101%	101%

Complexity (PC)

Configuration	MDCS	
	Encoder	Decoder
Loco Intra	112%	90%
Loco Random Access	99%	95%
Loco Low Delay	95%	93%

Complexity (cluster)

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Conclusion

- Parallel context processing friendly
  - No additional storage of scans
  - No significant complexity increase
- Performance
  - 1.2% Intra HE, 0.5% RA BD rate gain w.r.t. TMuC0.9(D239 + D260)
  - 0.6% Intra LoCo, 0.3 RA BD rate gain w.r.t. TMuC0.9(D374)
- Recommend for adoption to HM 1.0

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