



JVET-X0072

EE2-related: PDPC-skip Schemes For Angular Intra Modes

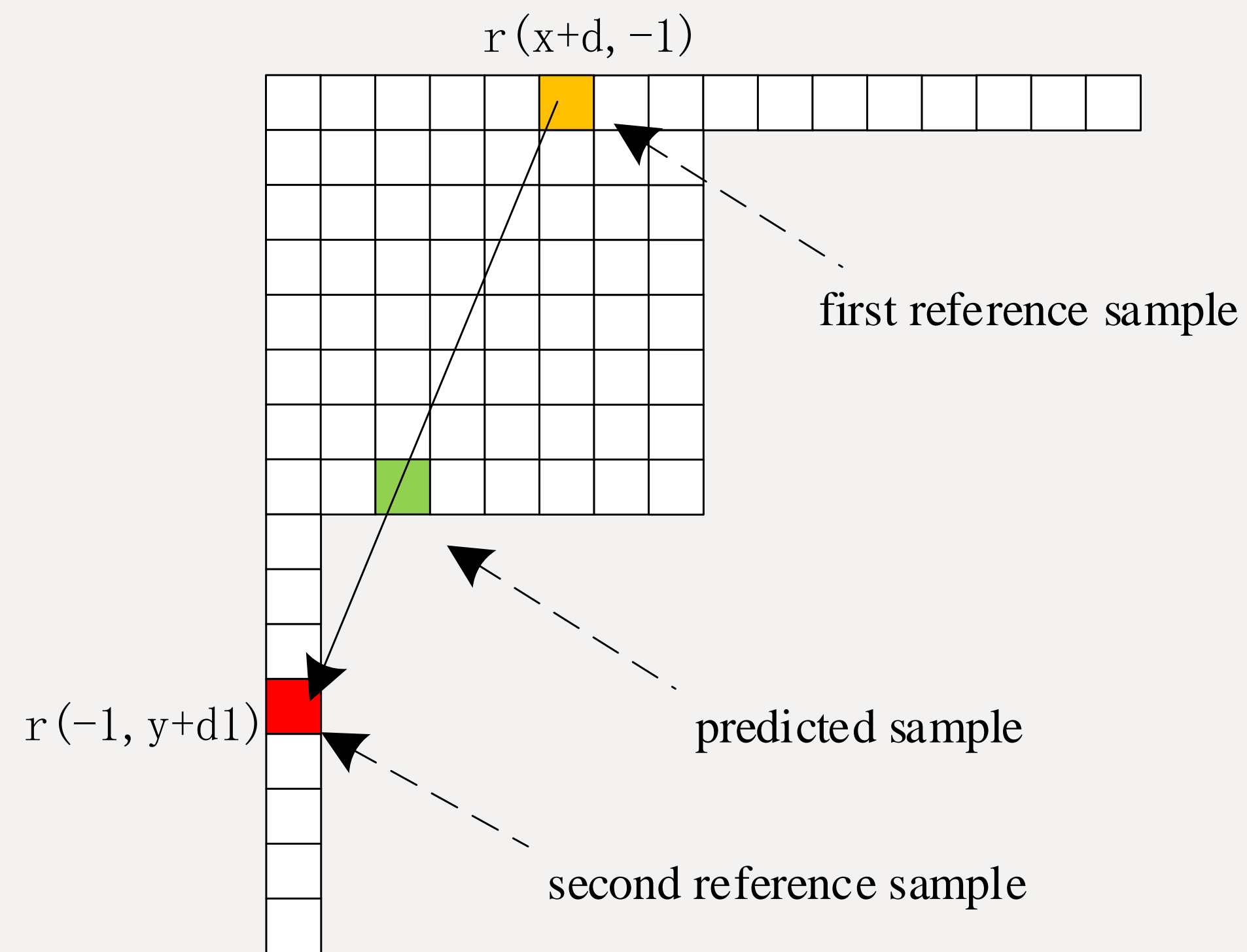
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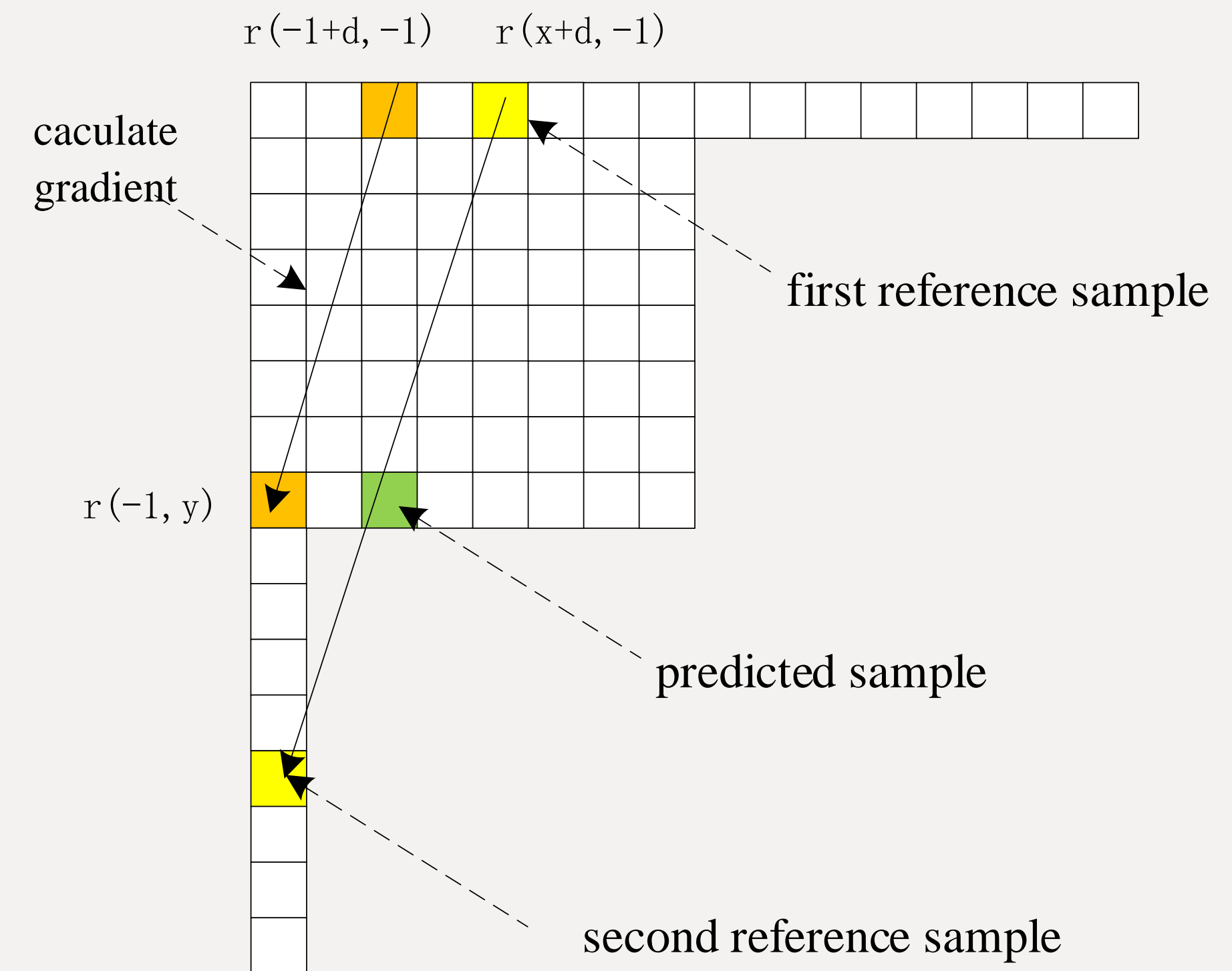


# Introduction

## PDPC



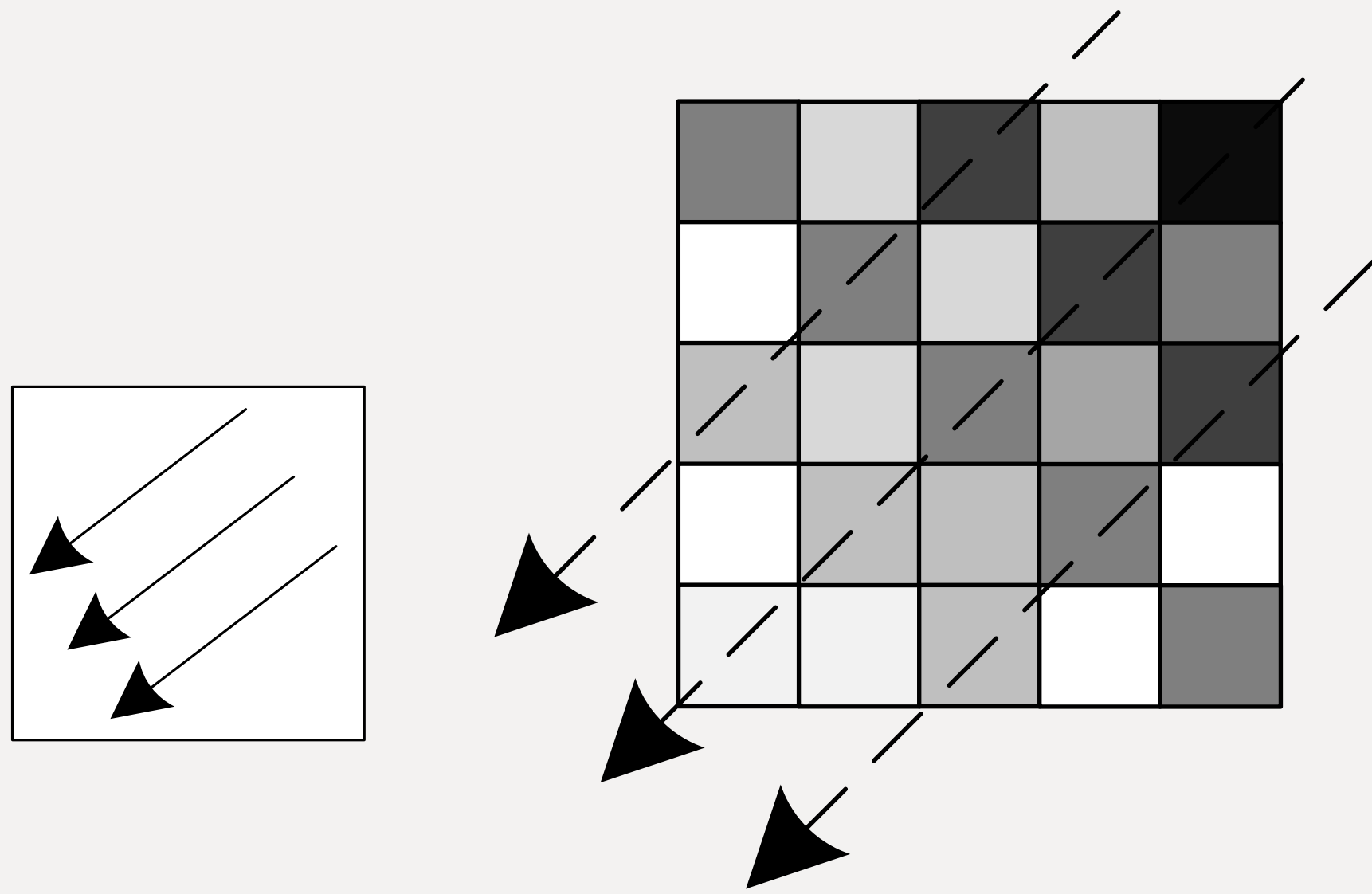
PDPC



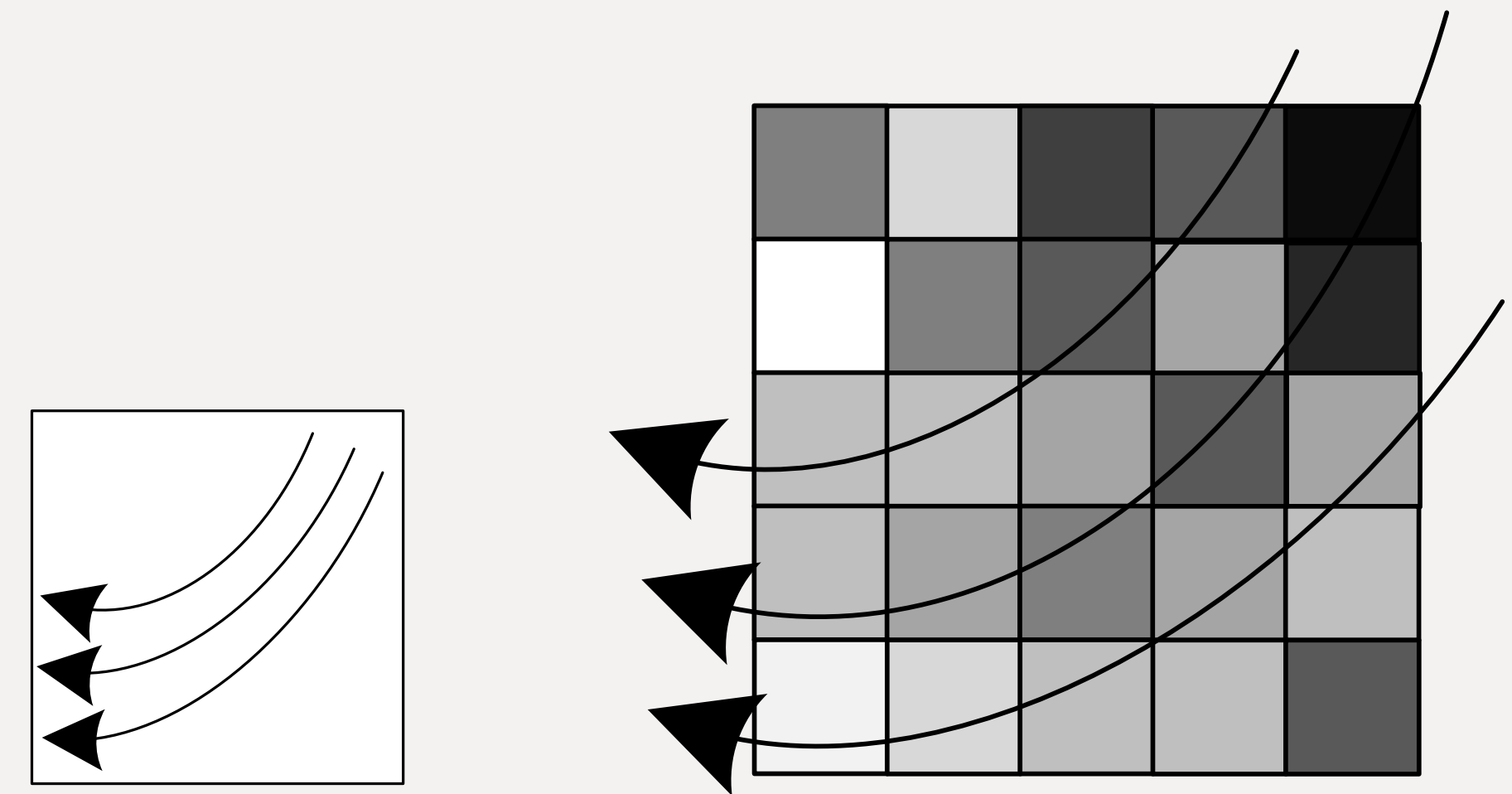
Gradient PDPC

# Motivations

- The direction of texture in the CU is along a straight line.



- The direction of texture in the CU is not along a straight line.
- It is not appropriate to apply PDPC in these cases.



# Proposed Method

## Skip Scheme 1

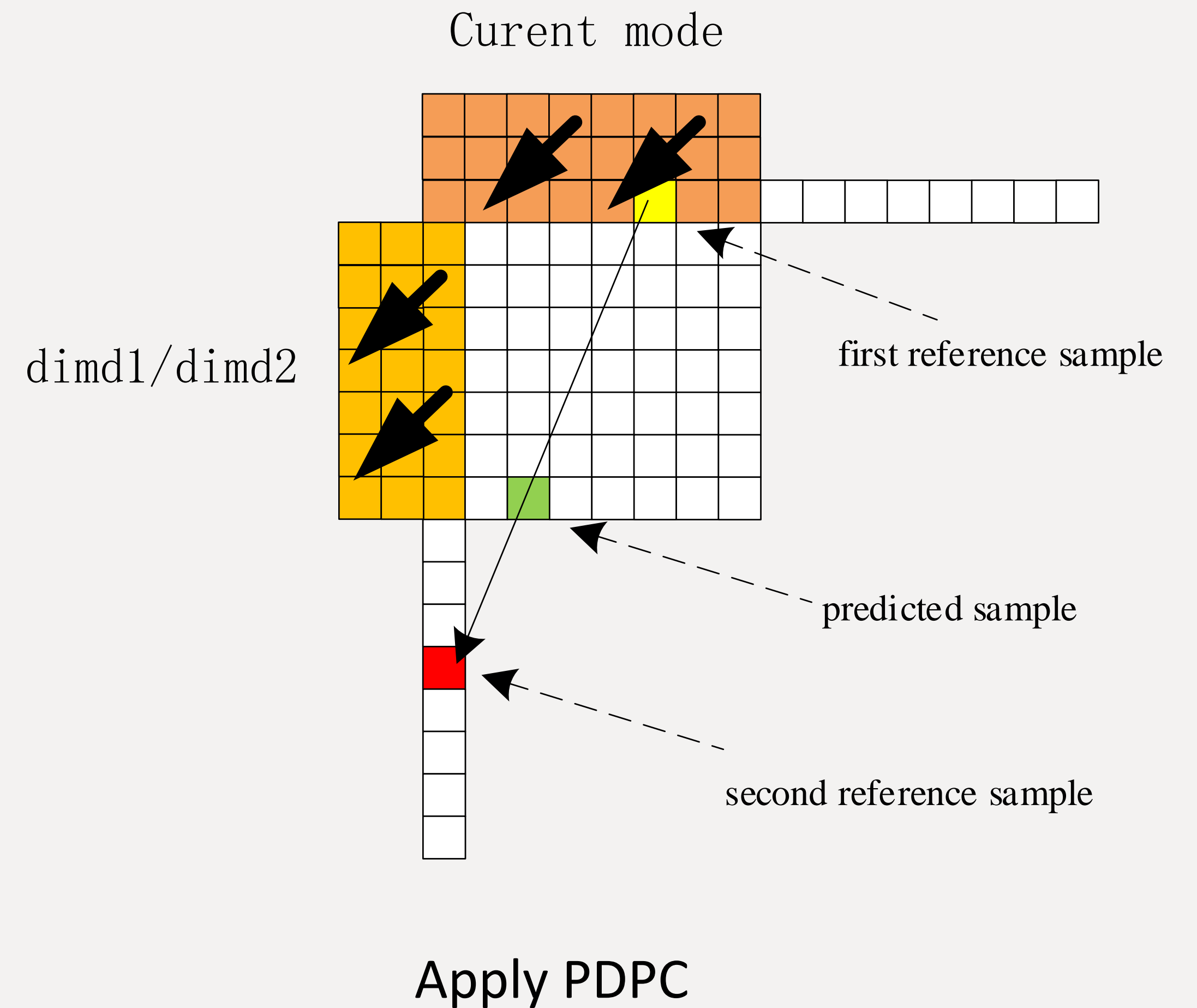
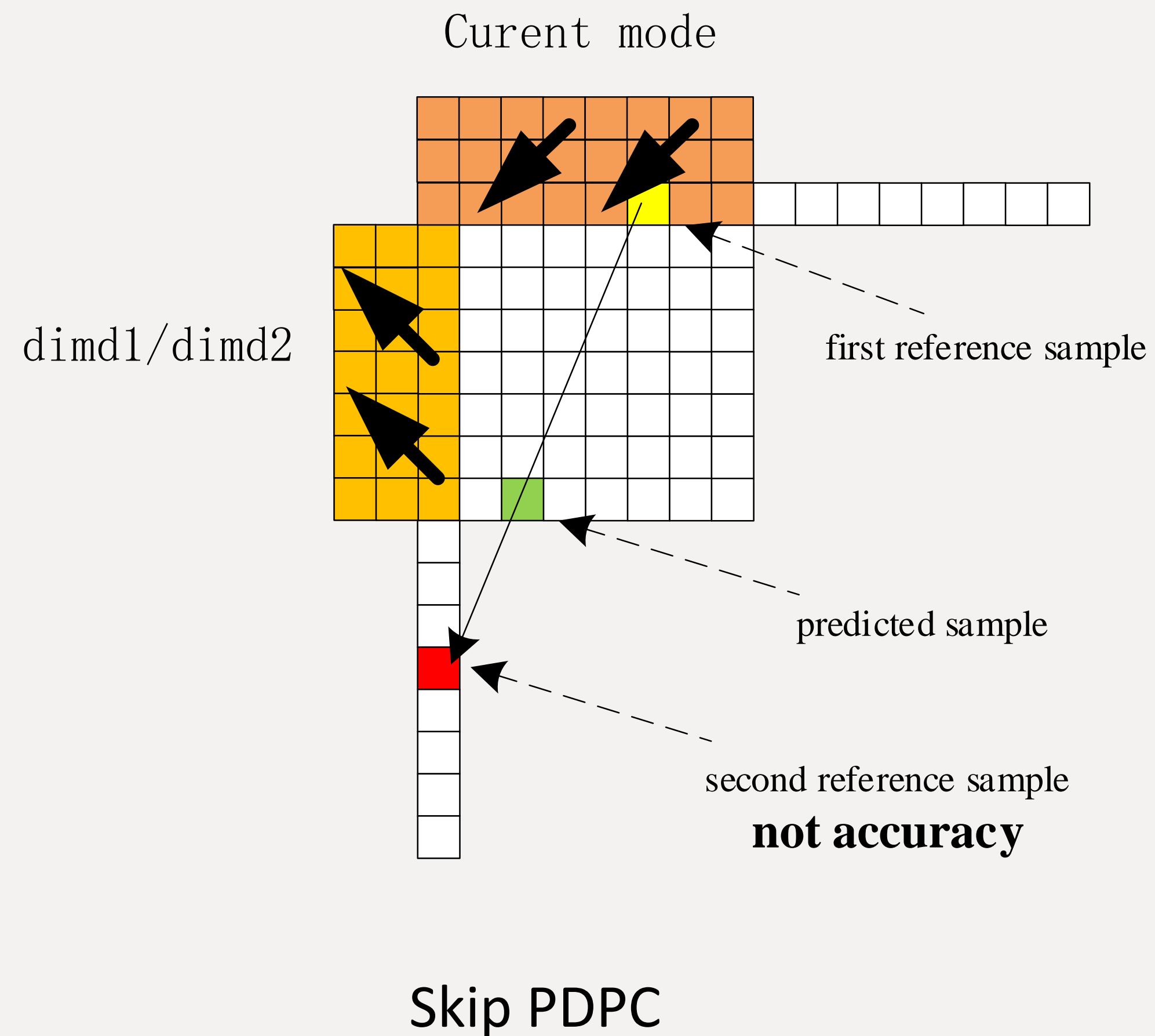
- Observations

➤ If the CU is coded using “true” TIMD mode, skip PDPC

	Y	U	V	Dec_skip_rate
Class A1	0.05%	0.12%	0.02%	15.95%
Class A2	0.06%	0.07%	0.09%	25.35%
Class B	0.03%	0.02%	0.07%	27.69%
Class C	-0.02%	0.11%	0.08%	30.23%
Class E	-0.01%	-0.03%	0.03%	34.18%
Overall	0.02%	0.06%	0.06%	26.68%
Class D	-0.05%	0.18%	-0.05%	27.96%
Class F	-0.16%	-0.21%	-0.20%	18.75%
Class TGM	-0.07%	-0.08%	-0.03%	9.67%

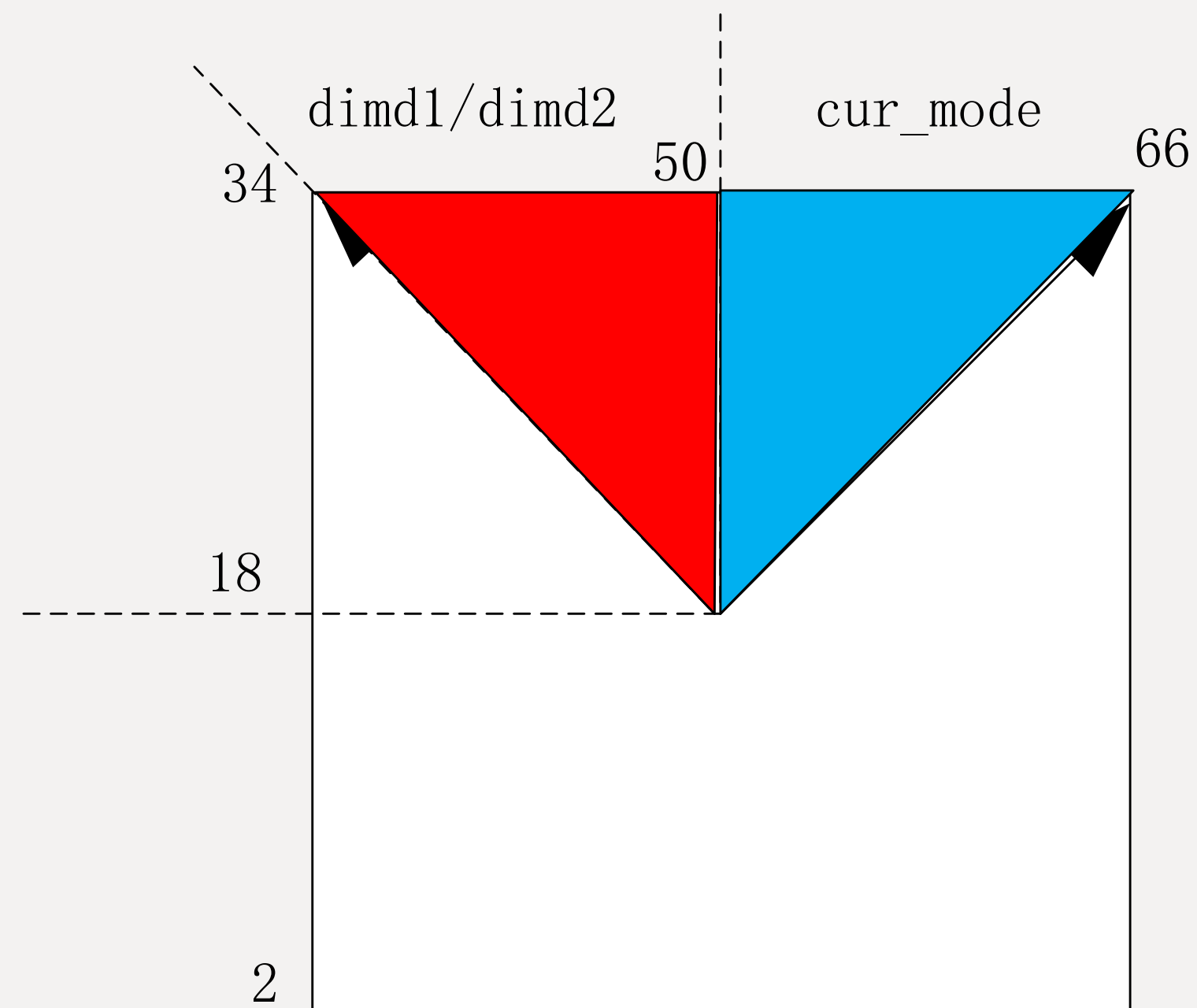
# Proposed Method

## PDPC Skip Scheme



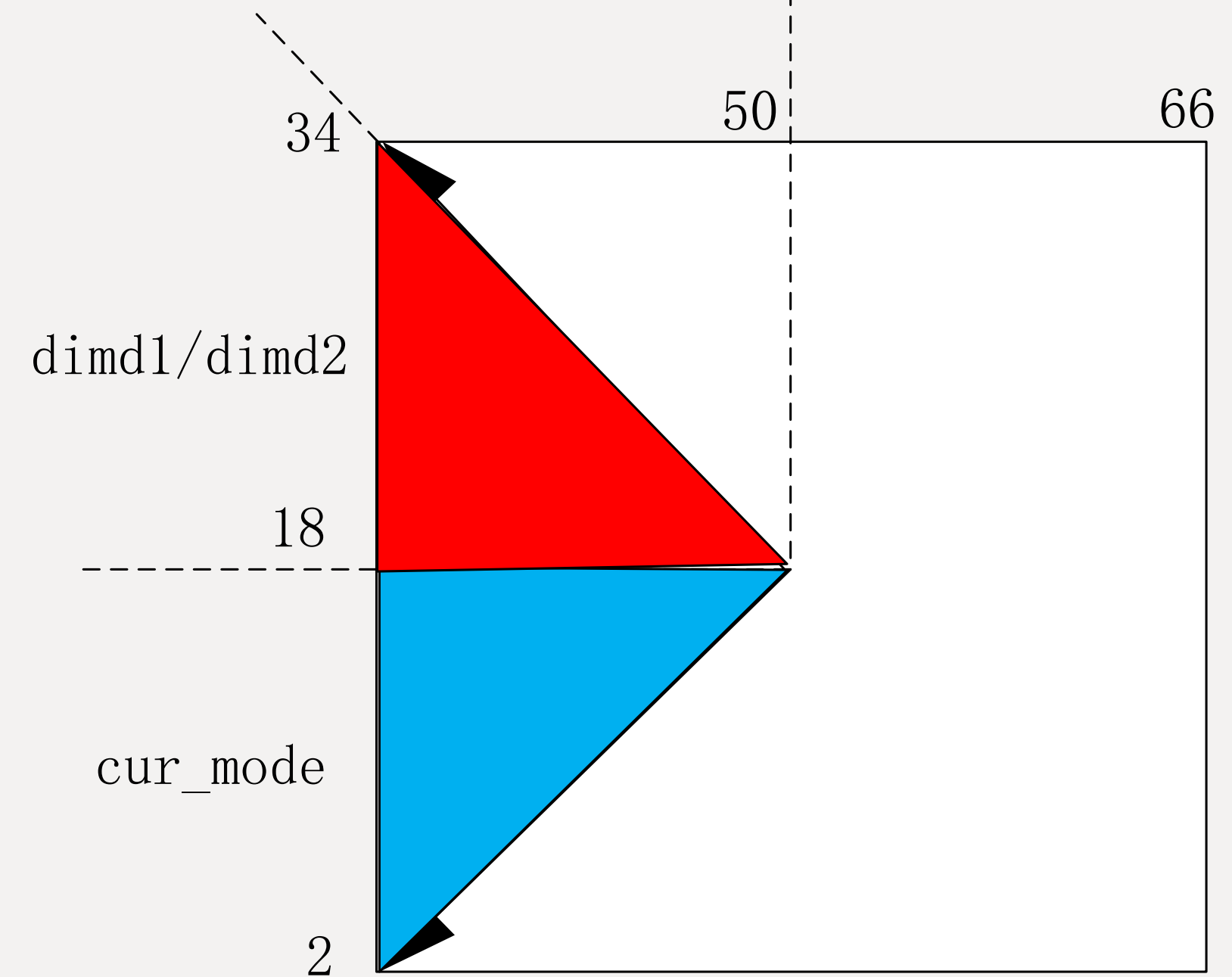
# Proposed Method

## Skip Scheme 2



### Case 1

- Current intra prediction mode is greater than 50
- *dimd1* or *dimd2* is between 34 and 50



### Case 2

- Current intra prediction mode is smaller than 18
- *dimd1* or *dimd2* is in between 18 and 34

# Proposed Method

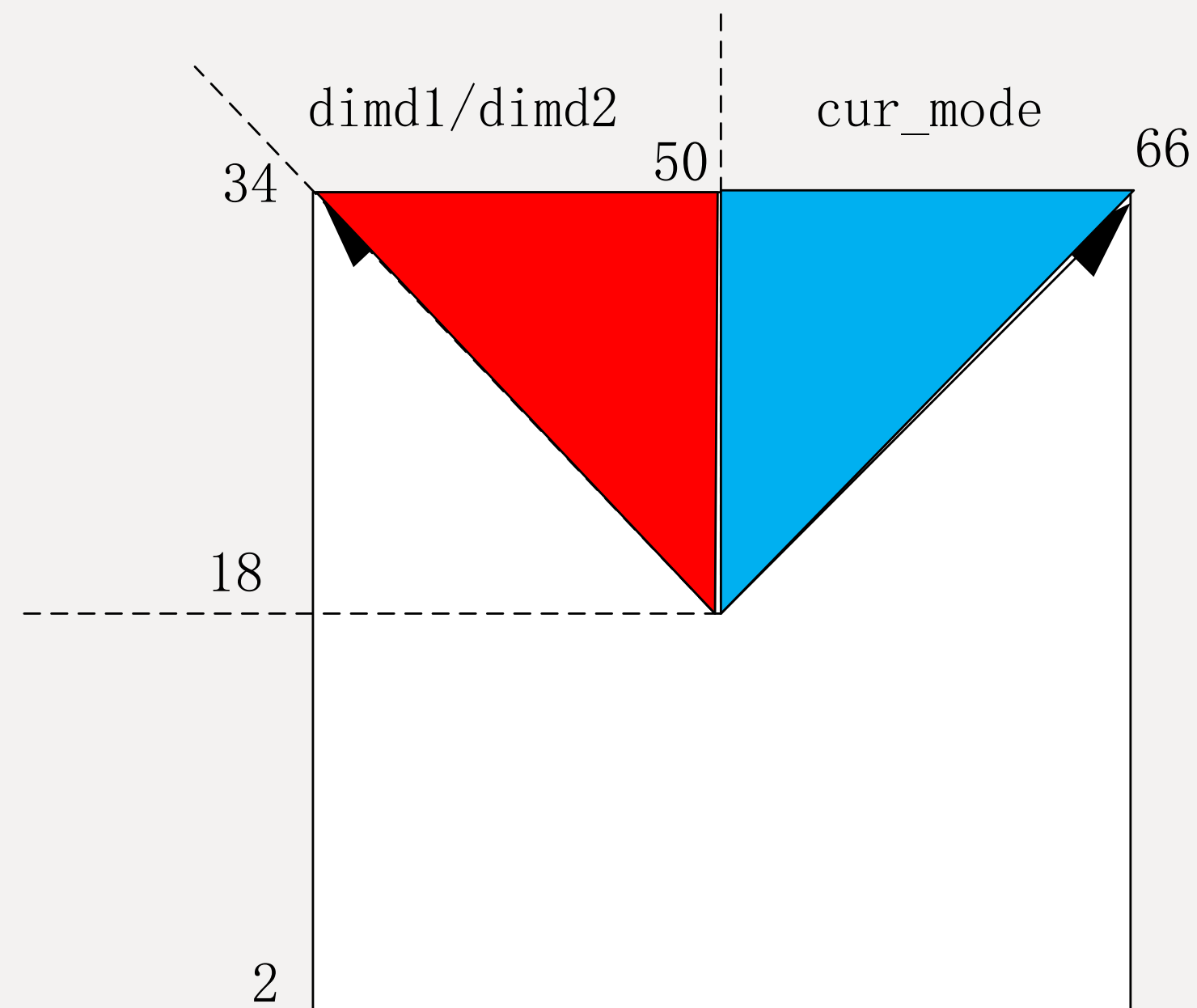
## Skip Scheme 2 - Results



	All Intra					
	Over VTM 7.0					
	Y	U	V	EncT	DecT	Dec_skip_rate
Class A1	0.04%	0.00%	-0.04%	100%	98%	11.57%
Class A2	0.03%	0.03%	0.08%	100%	99%	10.16%
Class B	0.03%	0.06%	-0.04%	100%	100%	10.94%
Class C	-0.01%	0.01%	0.13%	100%	99%	10.14%
Class E	0.02%	-0.10%	0.19%	100%	99%	8.38%
Overall	0.02%	0.01%	0.05%	100%	99%	10.24%
Class D	-0.02%	0.14%	-0.06%	100%	99%	11.69%
Class F	-0.02%	-0.12%	-0.07%	100%	99%	6.70%
TGM	-0.02%	-0.12%	-0.07%	100%	99%	4.49%

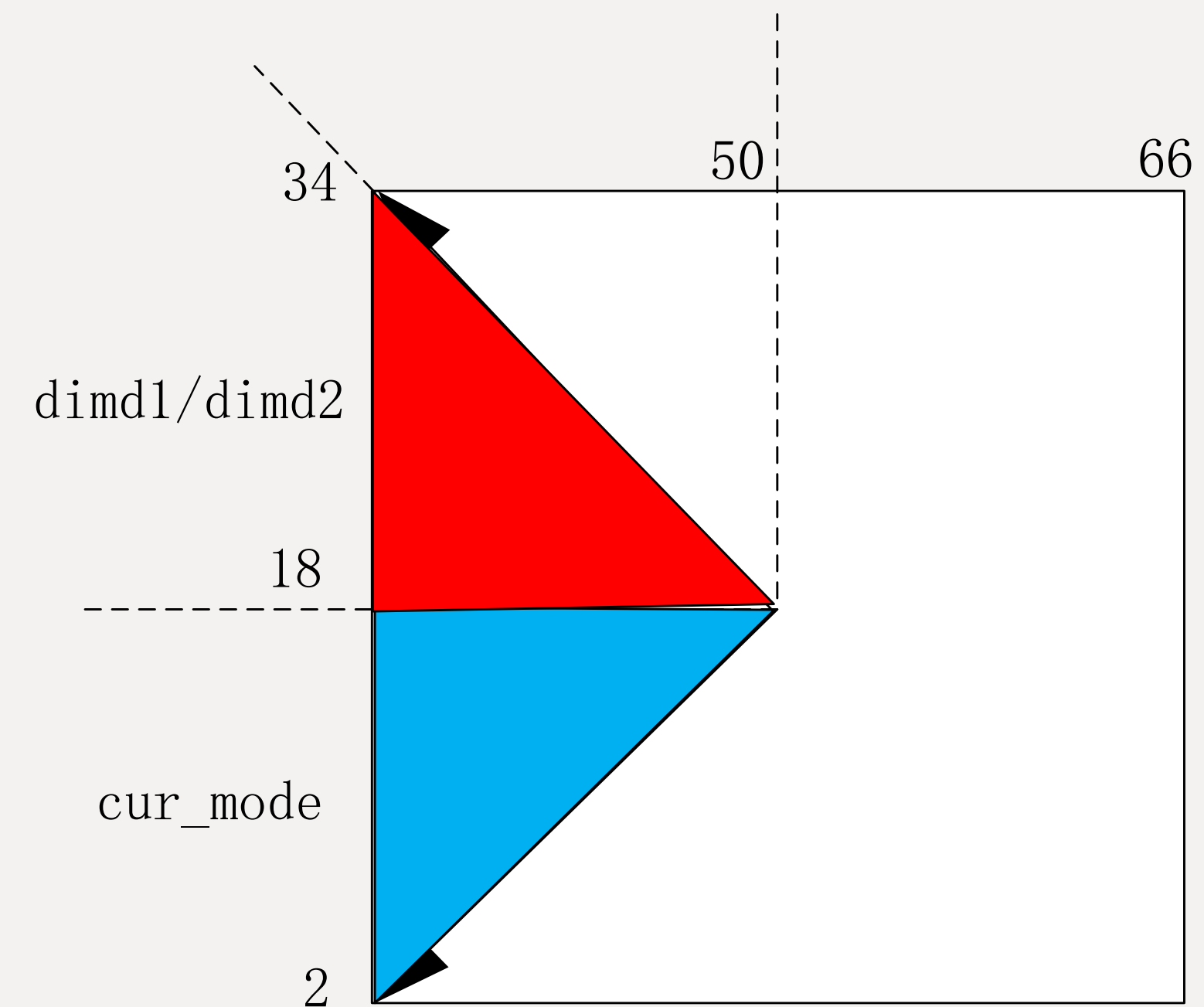
# Proposed Method

## Skip Scheme 3



### Case 1

- Current CU is coded with “true” TIMD mode
- Current intra prediction mode is greater than 50
- *dimd1* or *dimd2* is between 34 and 50



### Case 2

- Current CU is coded with “true” TIMD mode
- Current intra prediction mode is smaller than 18
- *dimd1* or *dimd2* is between 18 and 34



# Proposed Method

## Skip Scheme 3 - Results



	All Intra					
	Over VTM 7.0					
	Y	U	V	EncT	DecT	Dec_skip_rate
Class A1	0.09%	0.19%	-0.01%	100%	99%	28.87%
Class A2	0.09%	0.11%	0.16%	100%	98%	37.13%
Class B	0.08%	0.14%	0.15%	99%	99%	40.46%
Class C	0.00%	0.09%	0.11%	100%	99%	40.46%
Class E	0.05%	0.08%	0.29%	99%	98%	43.21%
Overall	0.06%	0.12%	0.14%	100%	99%	38.03%
Class D	-0.03%	0.14%	-0.02%	99%	99%	38.98%
Class F	-0.08%	-0.16%	-0.09%	100%	99%	25.17%
TGM	-0.08%	-0.16%	-0.09%	100%	99%	18.32%

# Conclusion

Method1	Y	U	V	Dec_skip_rate
OverAll	0.02%	0.06%	0.06%	26.68%
Class F	-0.16%	-0.21%	-0.20%	18.75%
TGM	-0.07%	-0.08%	-0.03%	9.67%
Method2	Y	U	V	Dec_skip_rate
OverAll	0.02%	0.01%	0.05%	10.24%
Class F	-0.02%	-0.12%	-0.07%	6.70%
TGM	-0.02%	-0.12%	-0.07%	4.49%
Method3	Y	U	V	Dec_skip_rate
OverAll	0.06%	0.12%	0.14%	38.03%
Class F	-0.08%	-0.16%	-0.09%	25.17%
TGM	-0.08%	-0.16%	-0.09%	18.32%

- Class F and Class TGM not only improve Y,U,V component but also reduce the PDPC process in both three methods. especially useful in Screen content encoding.

THANK YOU.

谢谢。



# Appendix 1



	All Intra					PDPC performance and complexity  forbid PDPC VS apply PDPC          1%
	Over VTM 7.0					
	Y	U	V	EncT	DecT	
Class A1	0.41%	0.46%	0.33%	99%	99%	
Class A2	0.36%	0.42%	0.45%	100%	99%	
Class B	0.37%	0.37%	0.37%	99%	99%	
Class C	0.25%	0.20%	0.21%	100%	99%	
Class E	0.44%	0.17%	0.37%	100%	99%	
Overall	0.36%	0.32%	0.34%	99%	99%	
Class D	0.19%	0.32%	0.06%	99%	100%	
Class F	0.07%	0.02%	0.01%	100%	100%	

# Appendix 2

Method 3	Y	U	V
FourPeople	0.09%	0.20%	0.18%
Johnny	0.01%	0.03%	0.43%
KristenAndSara	0.04%	0.01%	0.27%
ClassE	0.05%	0.08%	0.29%

$$Y = 0.299 * R + 0.587 * G + 0.114 * B$$
$$U = -0.169 * R - 0.331 * G + 0.5 * B$$
$$V = 0.5 * R - 0.419 * G - 0.081 * B$$





# Appendix 3

Method 3	Y	U	V
Tango2	0.13%	0.40%	0.05%
FoodMarket4	0.11%	0.04%	-0.02%
CampfireParty2	0.03%	0.14%	-0.05%
ClassA1	0.09%	0.19%	-0.01%



Method 3	Y	U	V
CatRobot1	0.10%	0.15%	0.25%
DaylightRoad2	0.14%	0.14%	0.19%
ParkRunning3	0.04%	0.05%	0.06%
ClassA2	0.09%	0.11%	0.16%

