

Photolithography Overlay Map Generation with Implicit Knowledge Distillation Diffusion Transformer

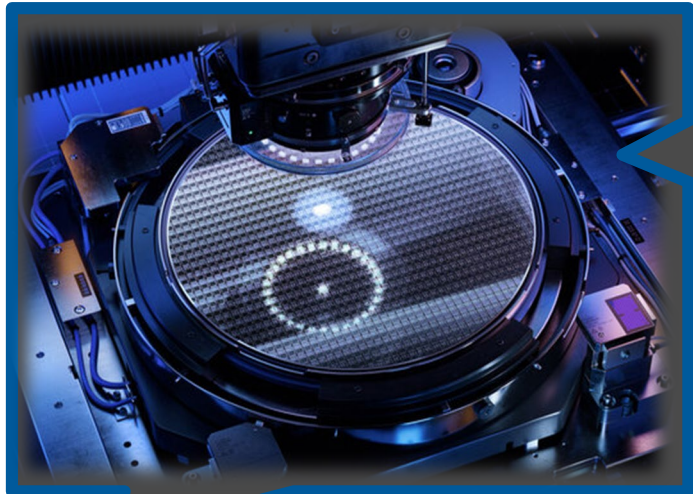
Yuan-Fu Yang¹, Hsiu-Hui Hsiao²

¹ National Yang Ming Chiao Tung University , ² National Taiwan University of Science and Technology

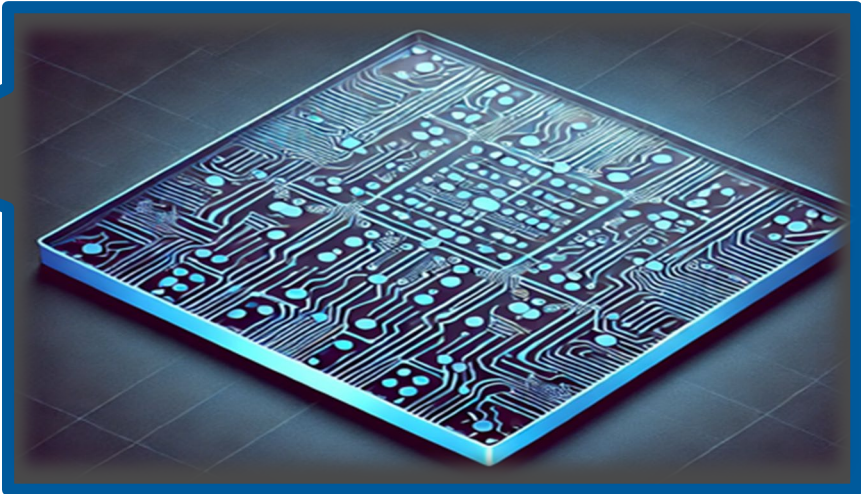
Equipment Logs (Text)

Equipment ID: RPxx01 | Tool Group: EUV | Reticle
Tool Log: Tool powered on | Initializing system
Calibration: EUV Source Power Calibration Comple
Process Recipe: LITHO_X200 | Wafer ID: WAF-54321
Exposure Parameters Set | Dose = 25 mJ/cm² | Wav
Reticle ID: 930A-5 | Verified | Mask Alignment C
Pre-Exposure Alignment: Success | X Offset = 0.0
Exposure Step Start | Field 1 | Wafer Stage Posi
EUV Exposure: Field 1 Complete | Exposure Time:

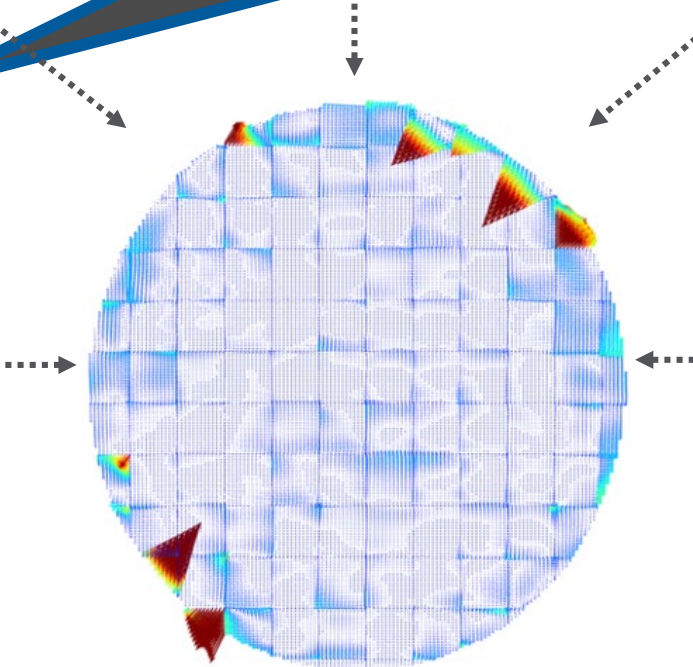
Exposure Chuck IDs (Label)



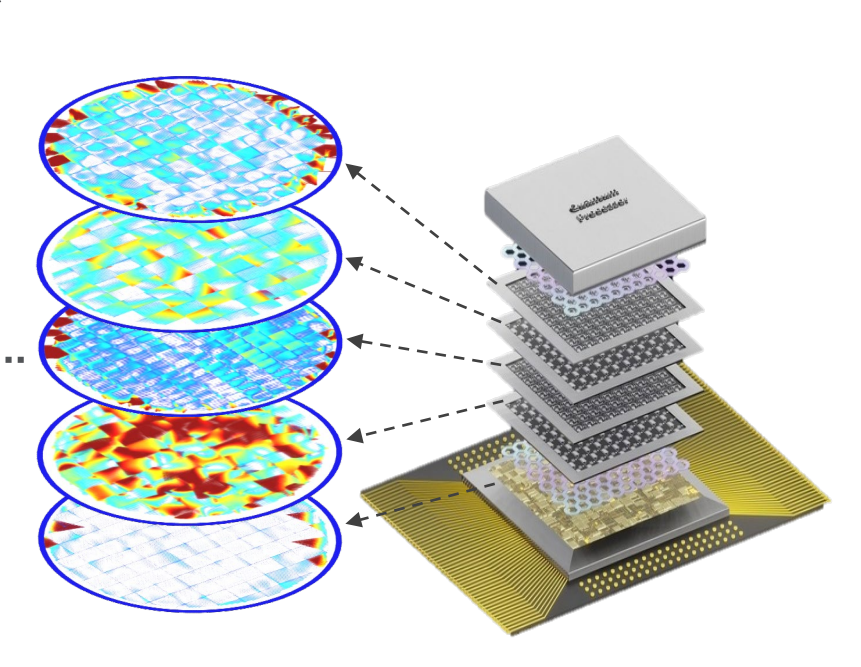
Reticle IDs (Label)



Equipment IDs (Label)



Current Layer Overlay Map

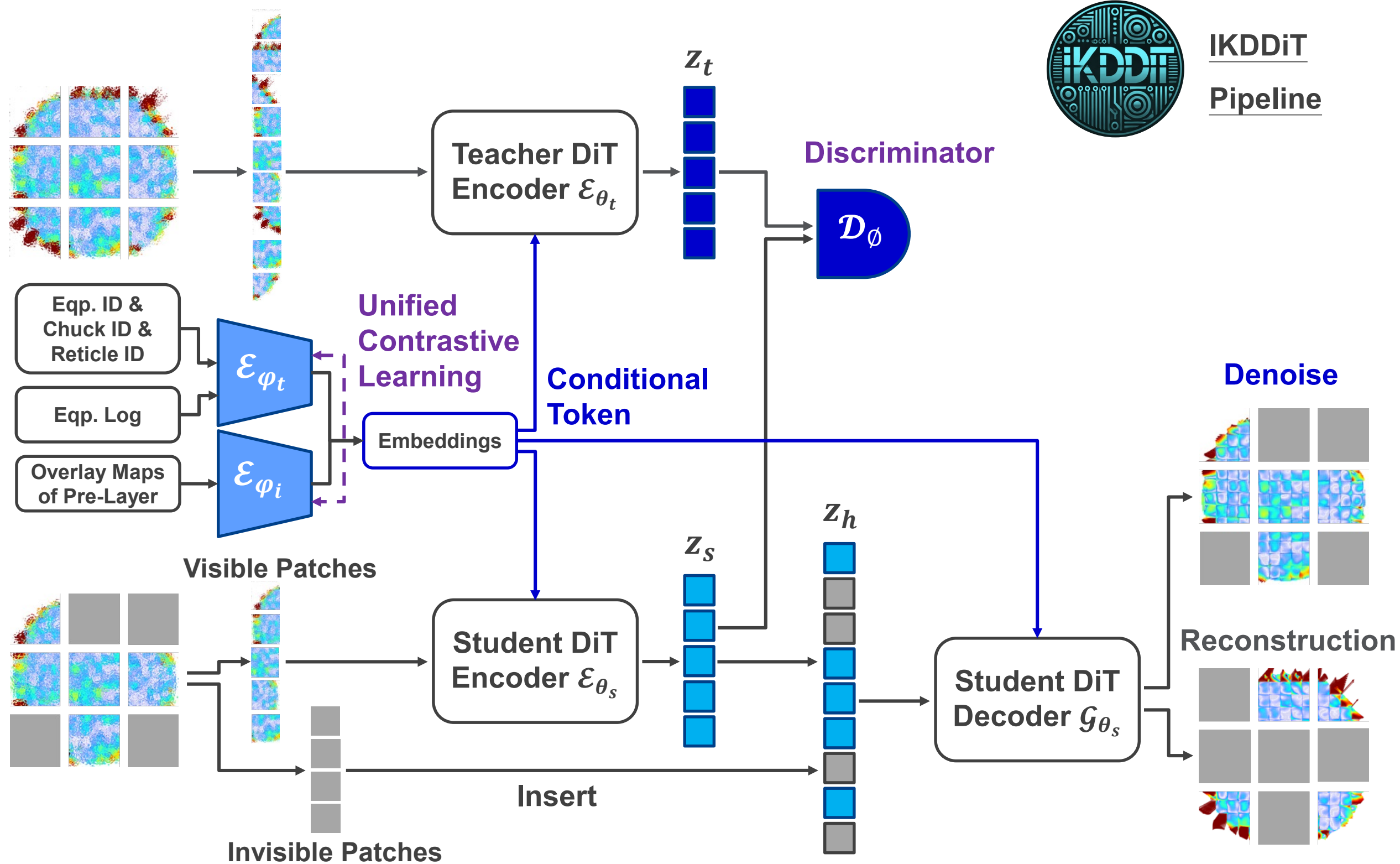


Pre-Layer Overlay Maps (Images)



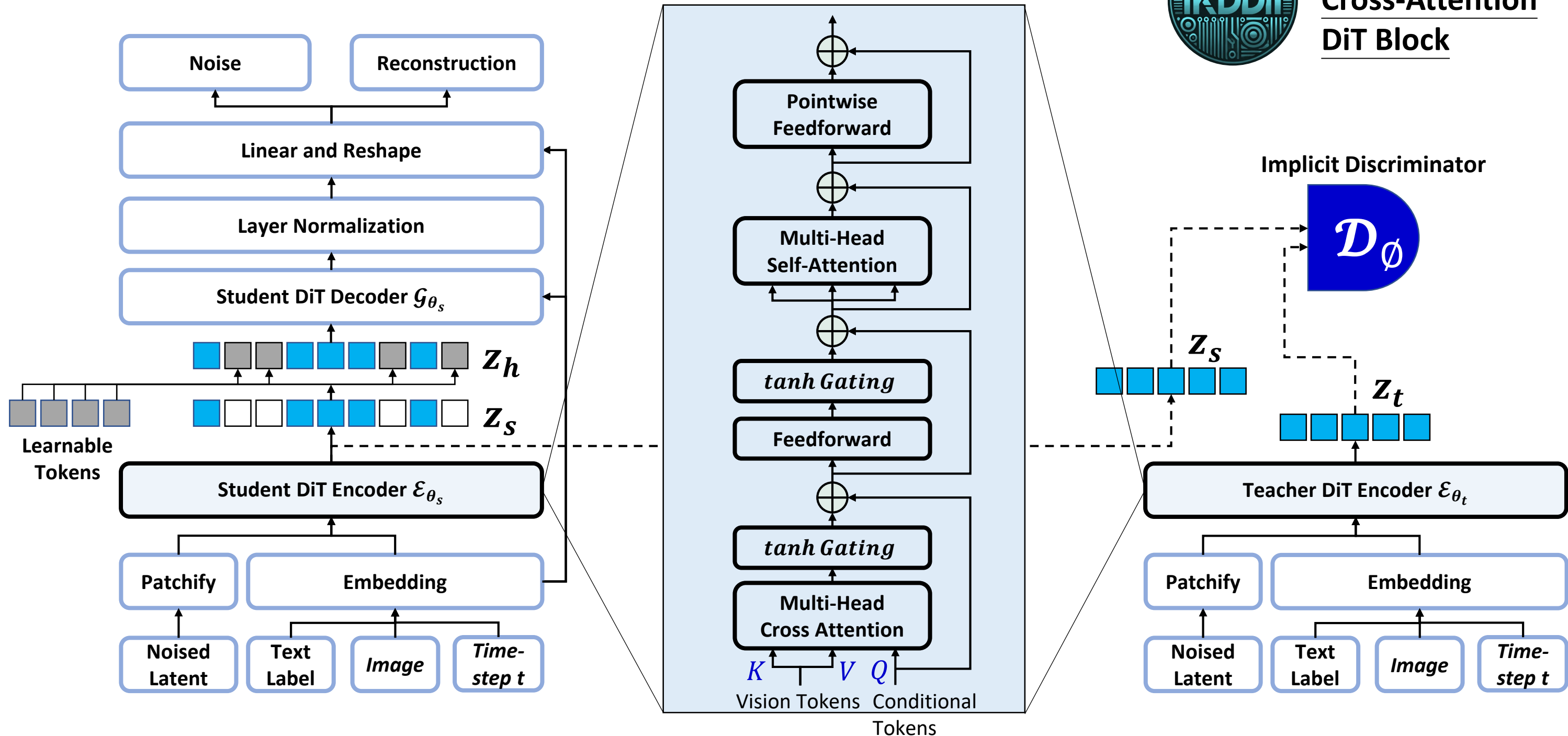
IKDDiT Pipeline

Label
Text
Image

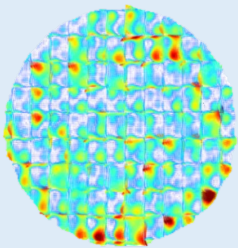
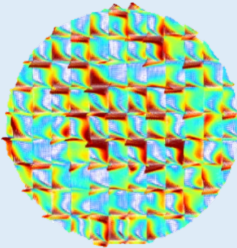
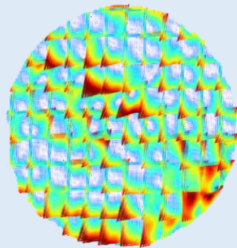
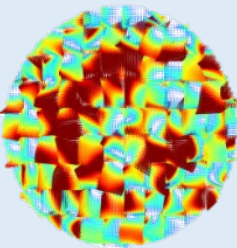
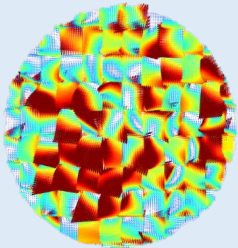
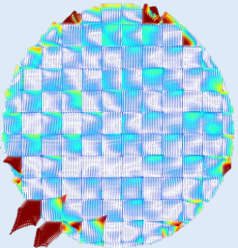
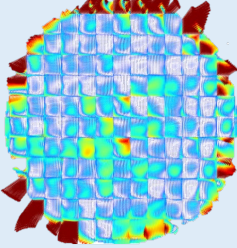
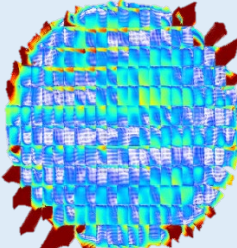
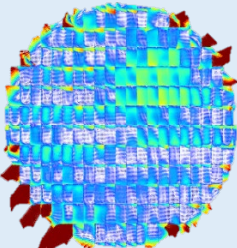
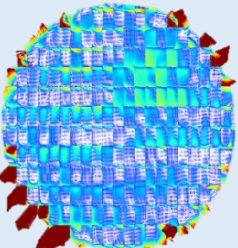
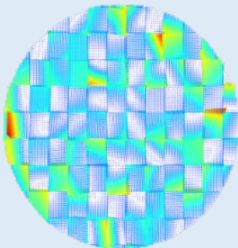
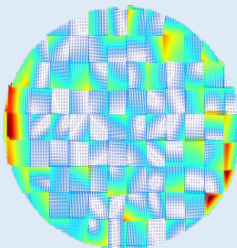
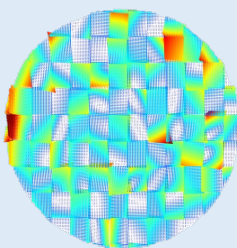
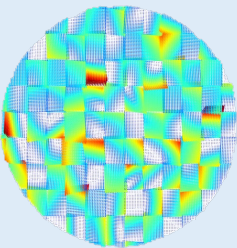
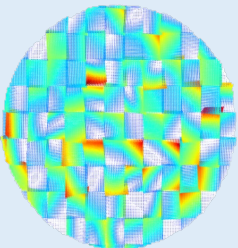
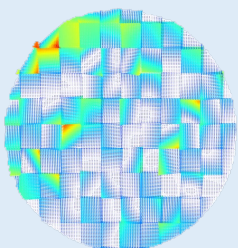
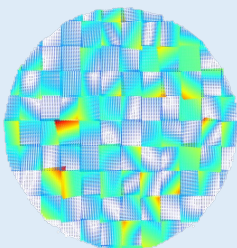
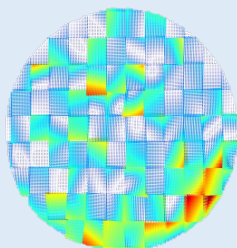
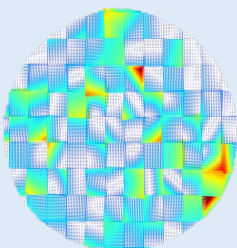
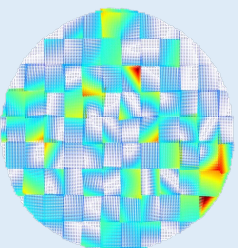
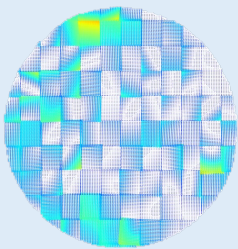
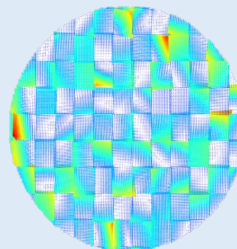
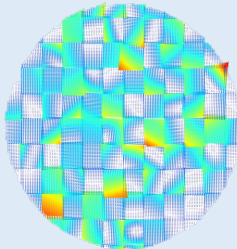
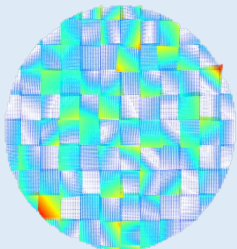
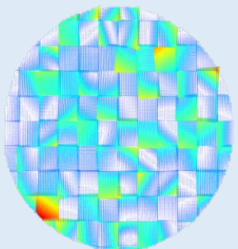




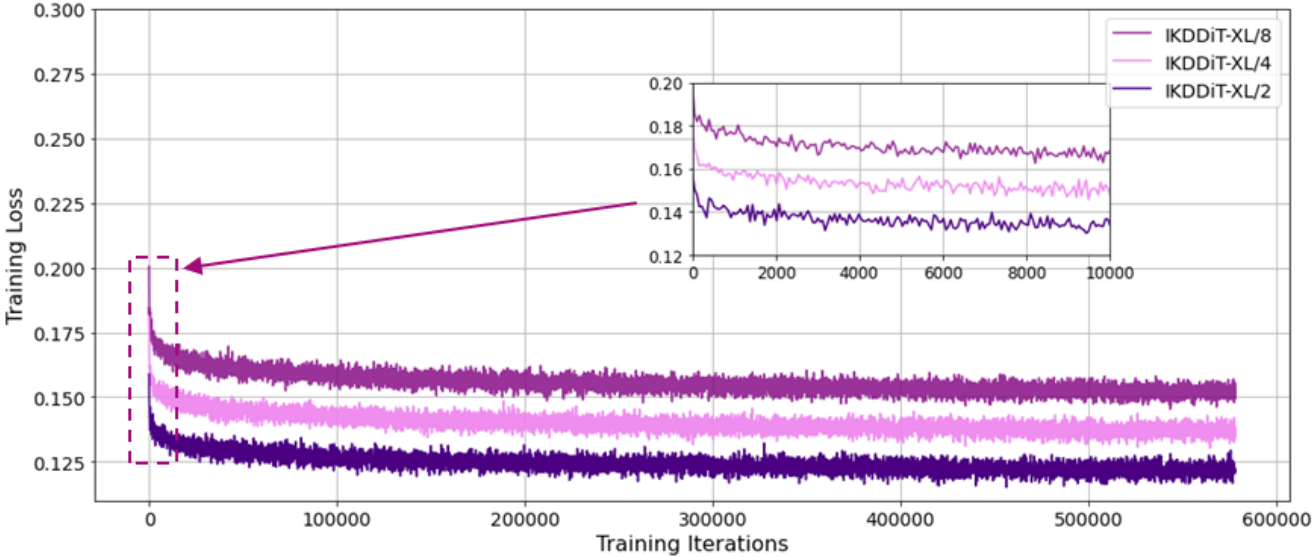
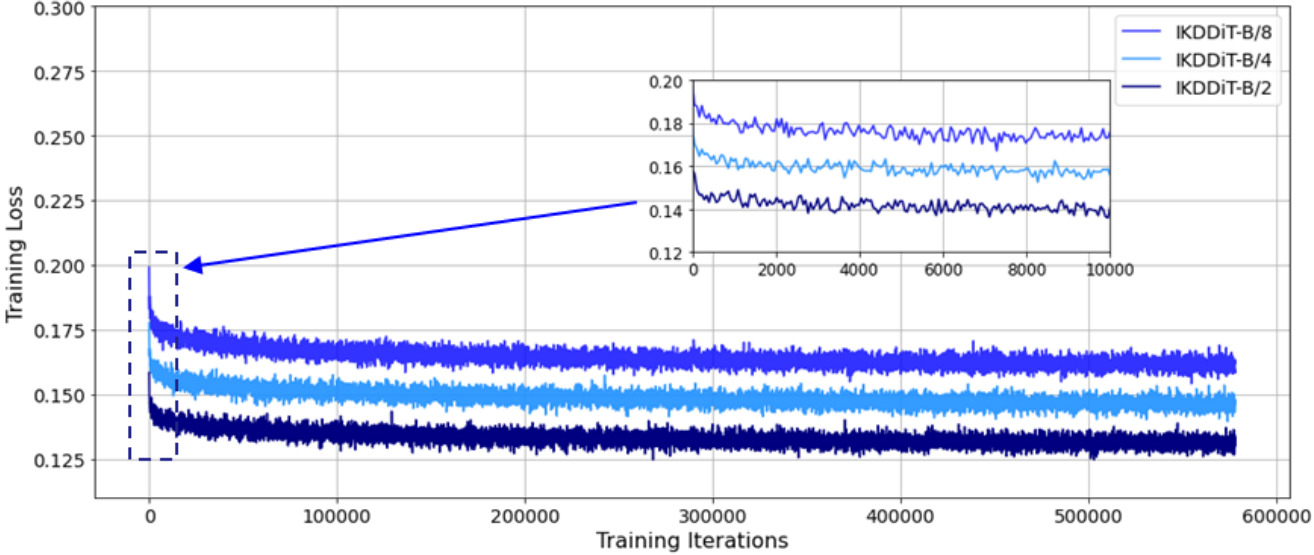
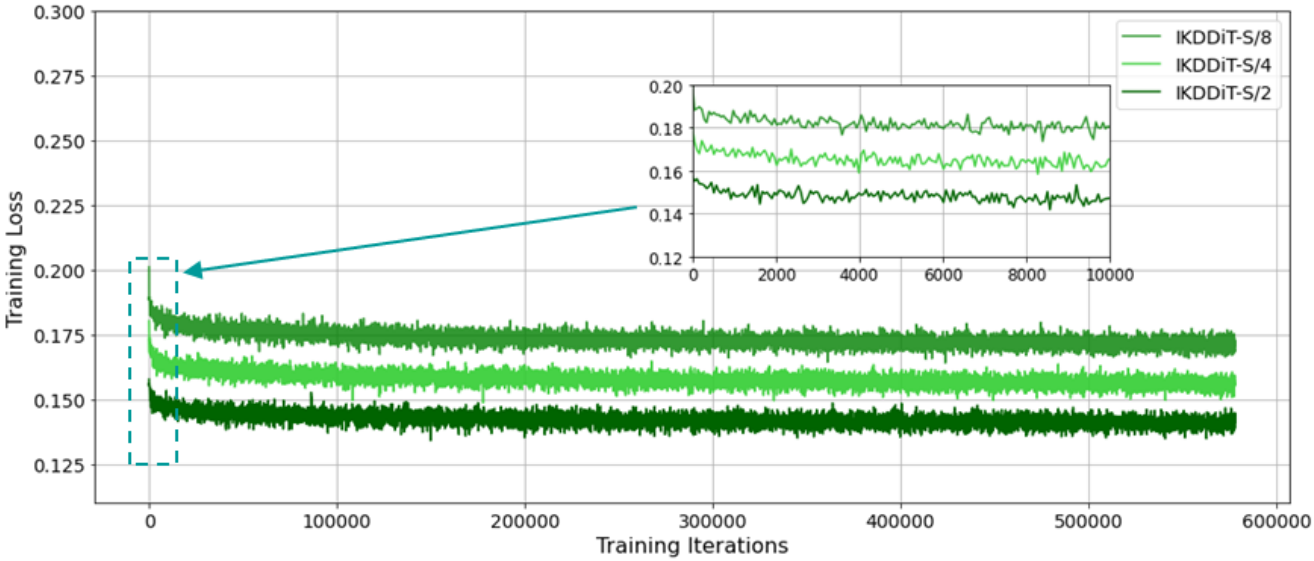
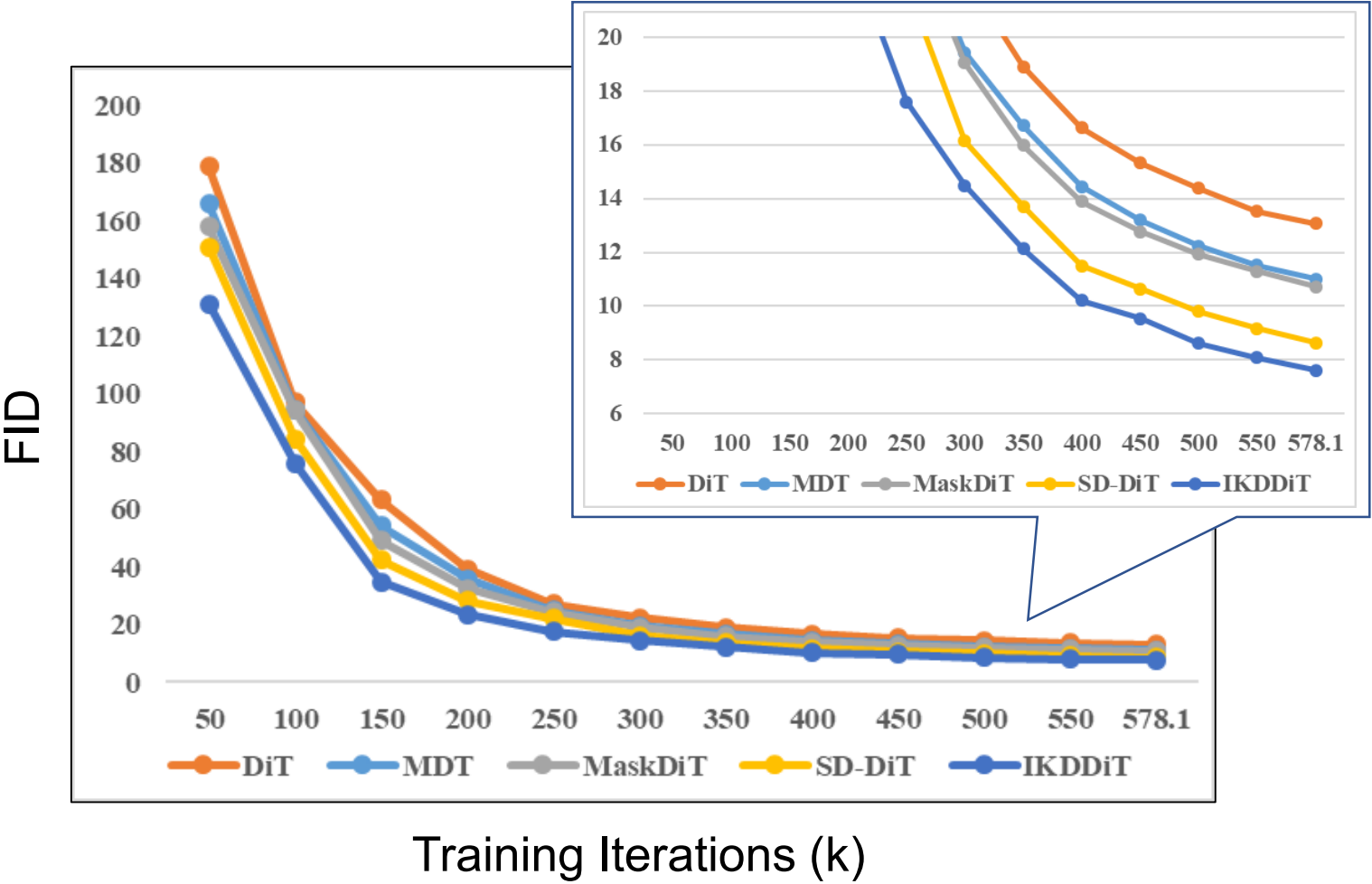
Gated Cross-Attention DiT Block



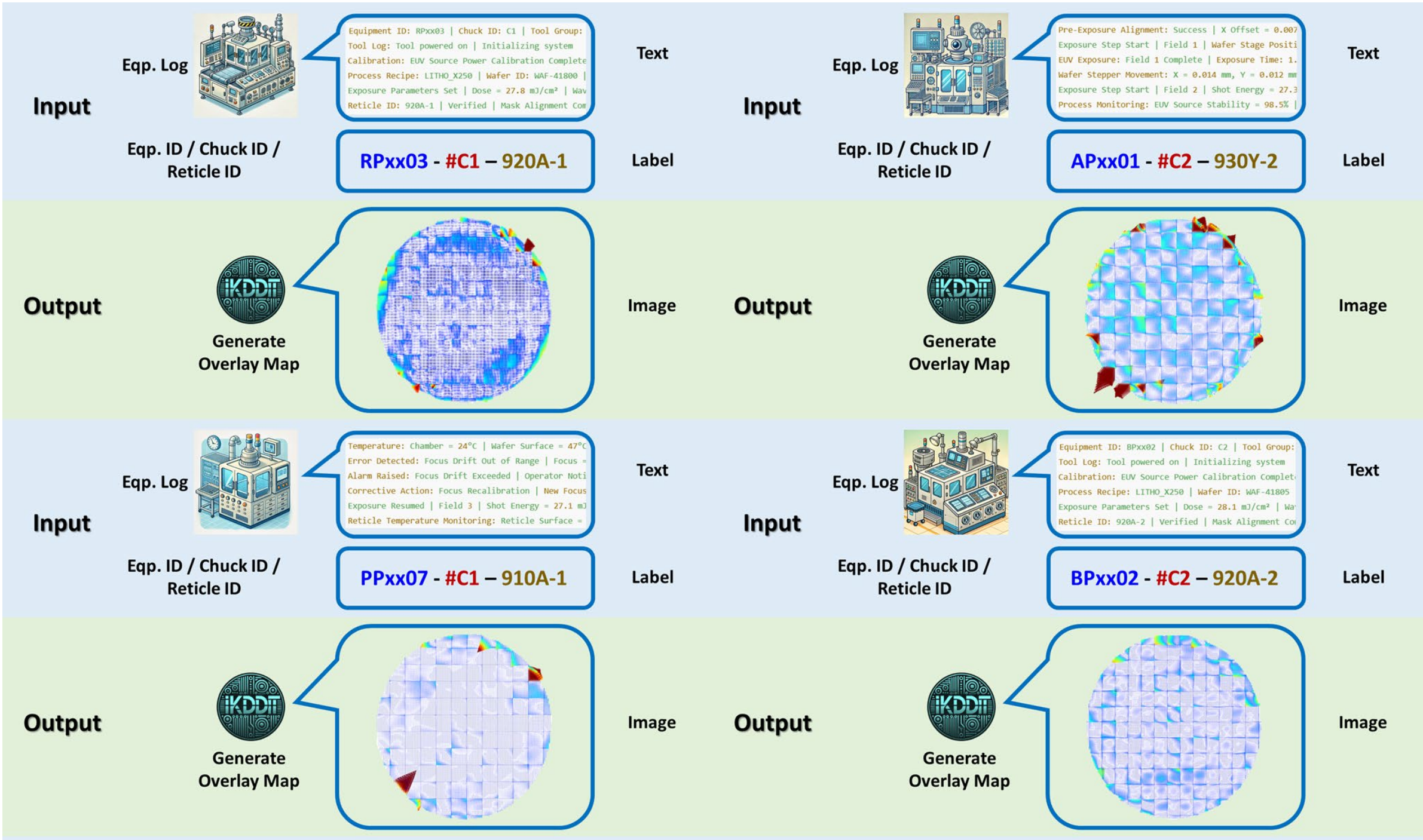
Visualization Results

Condition	MDT	MaskDiT	SD-DiT	IKDDiT (Ours)	GT
RPxx01 / #C1 / 930A-1 / Log1					
RPxx02 / #C2 / 930A-2 / Log2					
SPxx03 / #C1 / 920A-1 / Log3					
SPxx03 / #C2 / 920A-1 / Log4					
SPxx03 / #C2 / 920A-1 / Log5					

Training Efficiency



Representative Results



Thanks for your attention!

Yuan-Fu Yang¹, Hsiu-Hui Hsiao²

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