

Supplemental Material: EventAid: Benchmarking Event-aided Image/Video Enhancement Algorithms with Real-captured Hybrid Dataset

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of Computer Science, Peking University.

Project page: <https://sites.google.com/view/eventaid-benchmark>

0-1 THE ILLUSTRATIONS OF DIFFERENT SPATIOTEMPORAL SYNCHRONIZATION WAYS

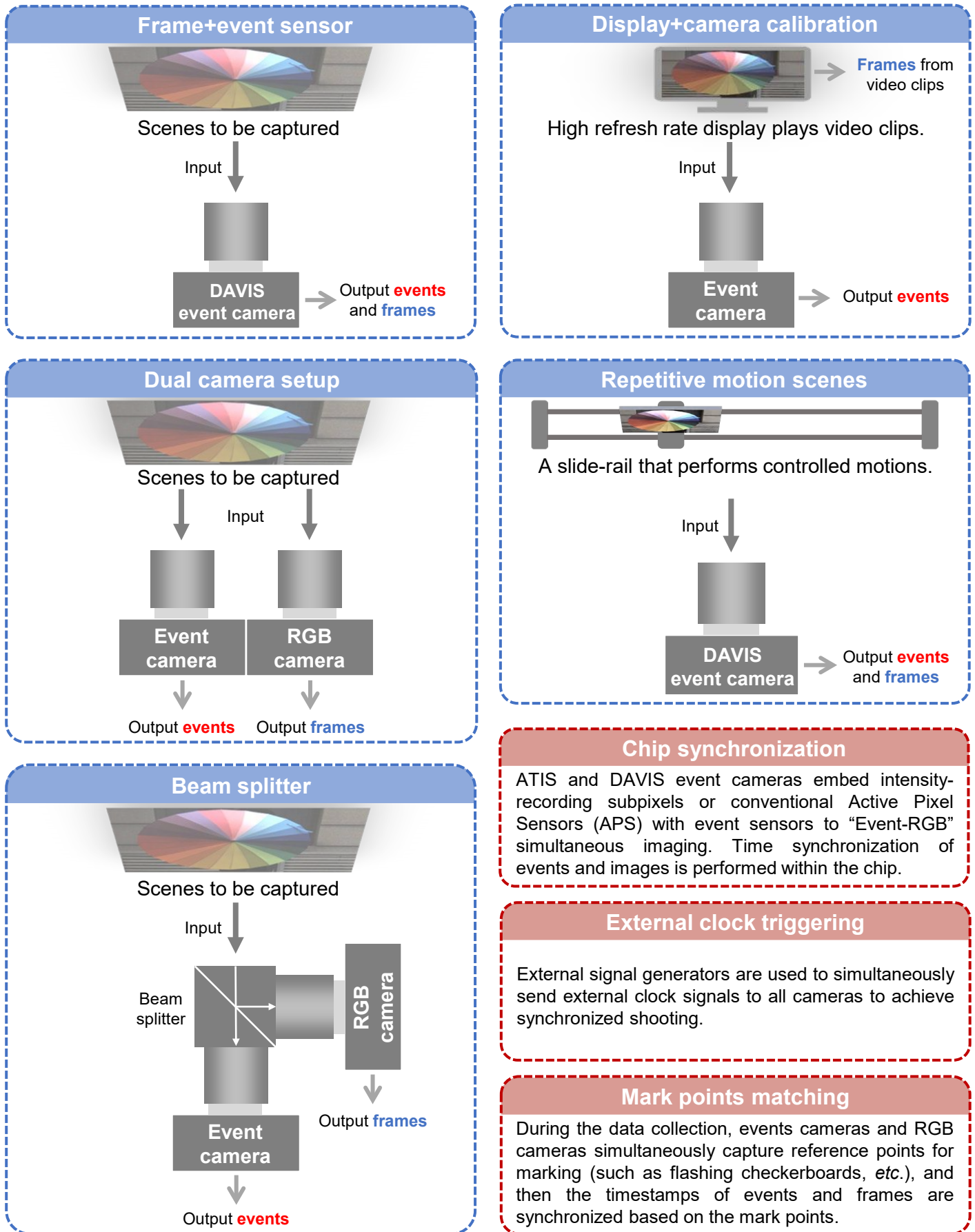


Figure S0: The illustrations of different spatiotemporal synchronization ways. The blue boxes illustrate the spatial matching ways, and the red boxes explain the temporal synchronization ways.

0-2 THE COMPARISON OF DATASET DIVERSITY

Comparing the datasets of event-aided HFR video reconstruction task											
Name	Spatial matching	Resolution	Color/ Gray	Frame count	Frame rate (FPS)	Indoor scene	Outdoor scene	ND Filter transmission	Depth diversity	Scene diversity	Ambient light diversity
BSERGB (CVPR22)	Beam splitter	970×625	Color	17556	28	✓	✓	\	Scenes with depth variations in both indoor and outdoor data	After categorizing, there are 2 indoor scenes and 4 outdoor scenes	Various lighting including both artificial and natural light
HSERGB (CVPR21)	Dual camera setup	~900×800	Color	39271	150~163	✓	✓	\	Relatively uniform depth	After categorizing, there are 2 indoor scenes and 5 outdoor scenes	Various lighting including both artificial and natural light
ERF-X170FPS (CVPR23)	Beam splitter	1440×975	Color	138600	170	✗	✓	\	Only outdoor depth variations, no close-up scenes	Only outdoor scenes	Captured solely outdoor scenes with ample lighting
ERDS (CVPR24)	Beam splitter	1024×720	Color	10465	75~108	✓	✗	\	Only a single indoor depth	Only a single indoor scene	Only indoor lighting
EventAid-F	Beam splitter	≥954×636	Color	44496	150	✓	✓	\	Scenes with depth variations in both indoor and outdoor data	After categorizing, there are 2 indoor scenes and 8 outdoor scenes	Various lighting including both artificial and natural light

Comparing the datasets of event-aided image deblurring task											
Name	Spatial matching	Resolution	Color/ Gray	Frame count	Frame rate (FPS)	Indoor scene	Outdoor scene	ND Filter transmission	Depth diversity	Scene diversity	Ambient light diversity
REBlur (ECCV21)	Repetitive motion scenes	320×260	Gray	1469	/	✓	✗	/	Only limited depth variation	The patterns on the board is the main shooting scene	Only indoor lighting
REVD (CVPR24)	Beam splitter	1024×768	Color	6270	/	✗	✓	25%	Only outdoor depth variations, no close-up scenes	Similar scenes captured at the same outdoor location	Only strong to weak sunlight, no indoor lighting
EVRB (ECCV24)	Beam splitter	960×640	Color	2533	/	✗	✓	12.5%	Only outdoor depth variations, no close-up scenes	Similar scenes captured at urban and traffic environment	Only strong to weak sunlight, no indoor lighting
EventAid-B	Beam splitter	~1270×710	Color	4088	1,10,20	✓	✓	25%, 10%, 2%	Scenes with depth variations in both indoor and outdoor data	After categorizing, there are 6 indoor scenes and 8 outdoor scenes	Various lighting including both artificial and natural light

Comparing the datasets of event-aided HDR image reconstruction task											
Name	Spatial matching	Resolution	Color/ Gray	Frame count	Frame rate (FPS)	Indoor scene	Outdoor scene	ND Filter transmission	Depth diversity	Scene diversity	Ambient light diversity
Zou et al. (CVPR21)	Beam splitter	320×240	Gray	92160	2000	✓	✗	5%	Only outdoor depth variations, no close-up scenes	12 outdoor scenes	Only outdoor lighting
EventAid-D	Beam splitter	~1270×710	Color	5173	50, 20, 5	✓	✓	25%, 10%	Scenes with depth variations in both indoor and outdoor data	After categorizing, there are 5 indoor scenes and 8 outdoor scenes	Various lighting including both artificial and natural light

Orange values are obtained by counting data from the downloaded official dataset, while **blue** values are derived directly or through straightforward calculations from metrics stated in the main text or supplementary materials of the original papers.

1 QUALITATIVE COMPARISON RESULTS: EVENT-BASED VIDEO RECONSTRUCTION

1.1 Results on real-captured EVENTAID-R dataset

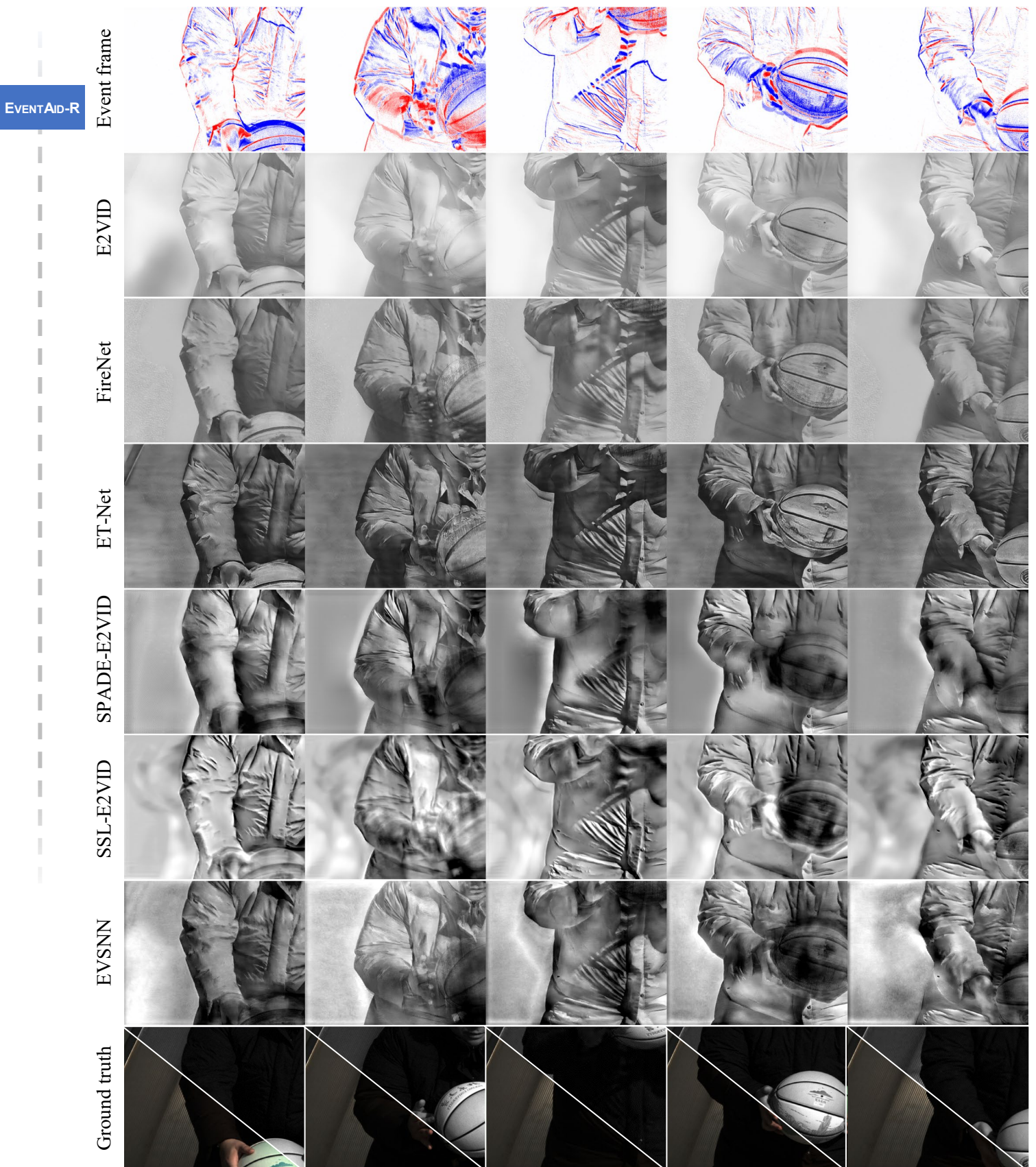


Figure S1-1: Comparison results of real-captured EVENTAID-R dataset (#1 R-BALL)

EVENTAID-R

Event frame
E2VID
FireNet
ET-Net
SPADE-E2VID
SSL-E2VID
EVSNN
Ground truth

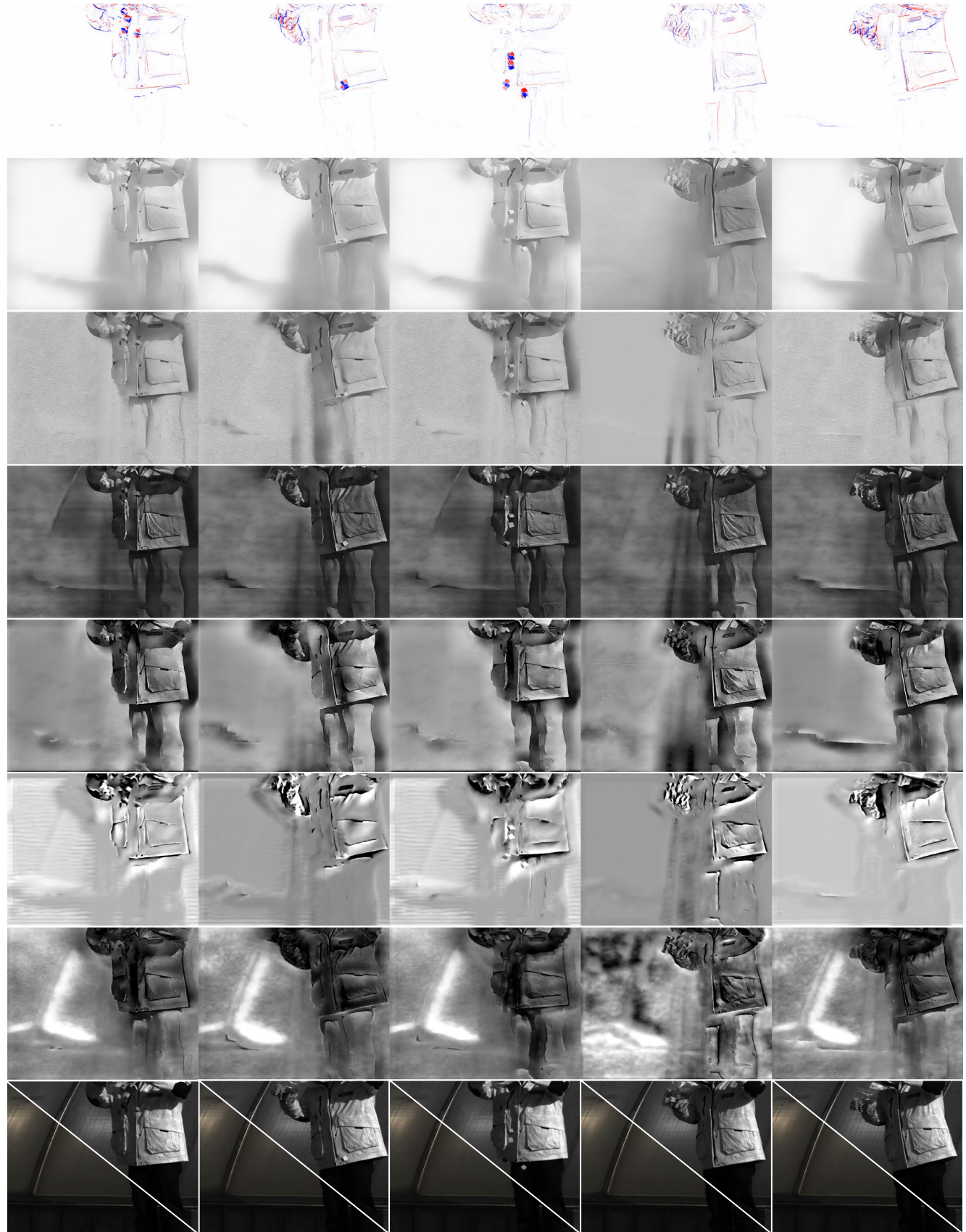


Figure S1-2: Comparison results of real-captured EVENTAID-R dataset (#2 R-BLOCKS)

EVENTAID-R

Event frame



E2VID



FireNet



ET-Net



SPADE-E2VID



SSL-E2VID



EVSNN



Ground truth

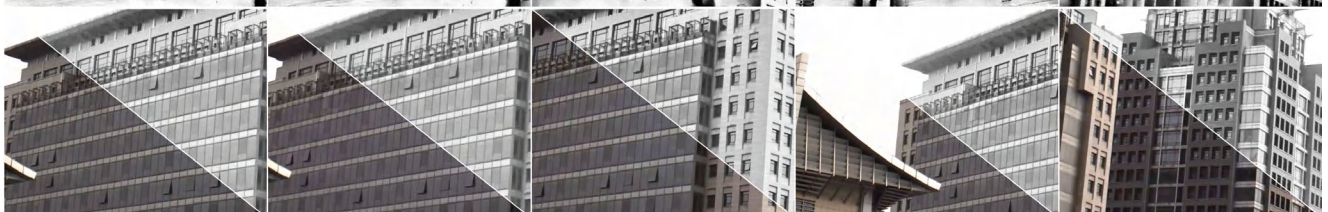


Figure S1-3: Comparison results of real-captured EVENTAID-R dataset (#3 R-BUILDING)

EVENTAID-R

Event frame



E2VID



FireNet



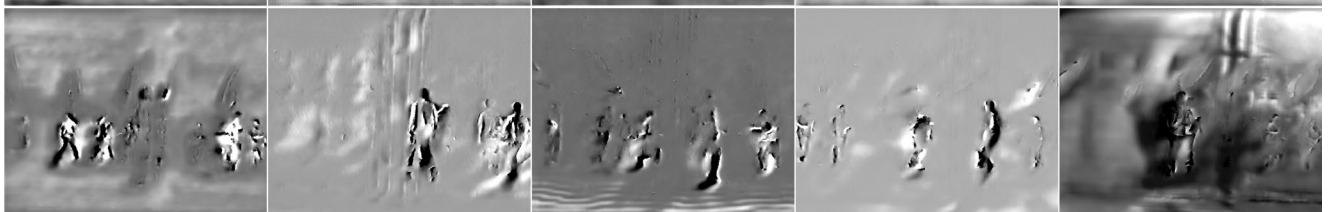
ET-Net



SPADE-E2VID



SSL-E2VID



EVSNN



Ground truth



Figure S1-4: Comparison results of real-captured EVENTAID-R dataset (#4 R-PLAYBALL)

EVENTAID-R

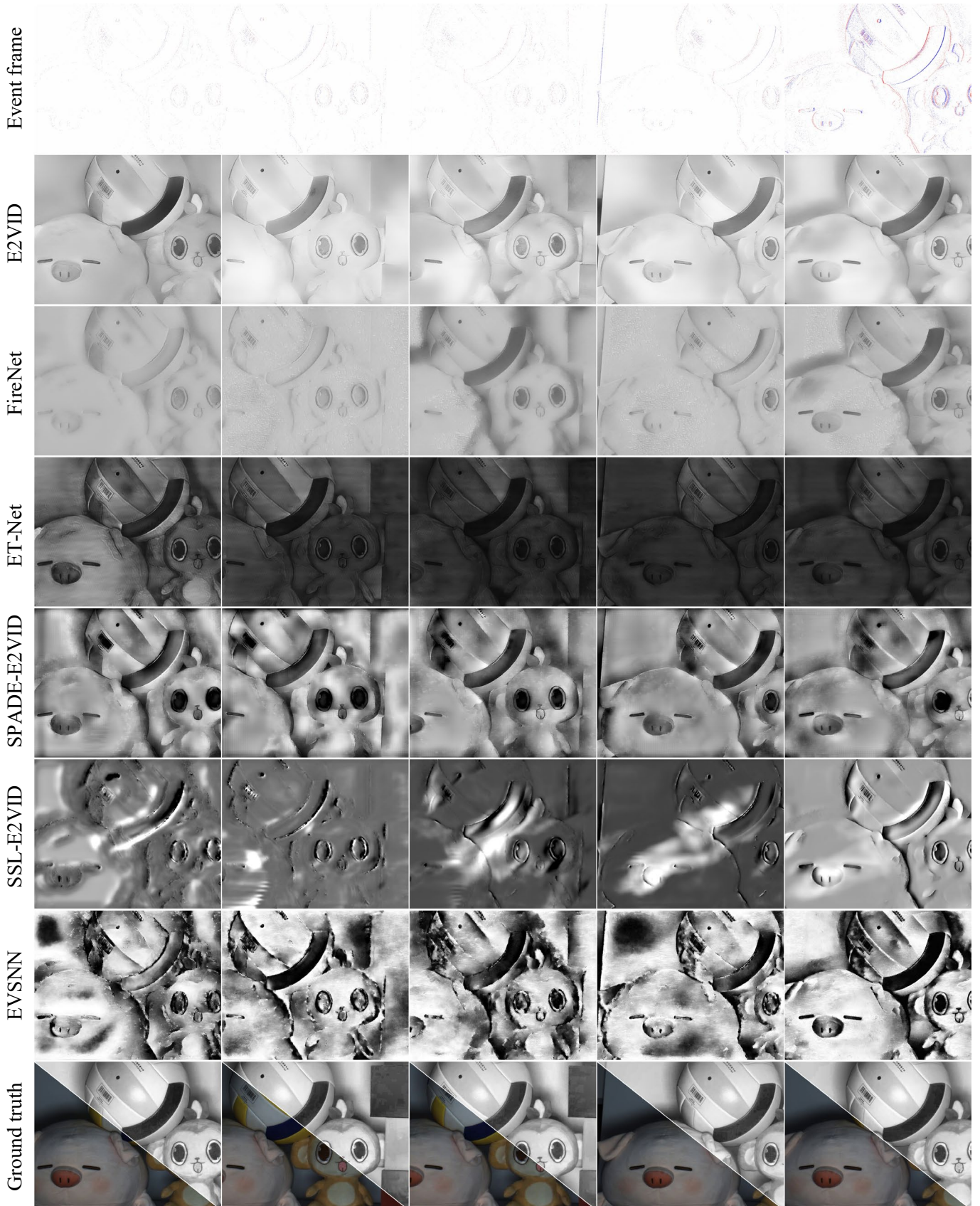
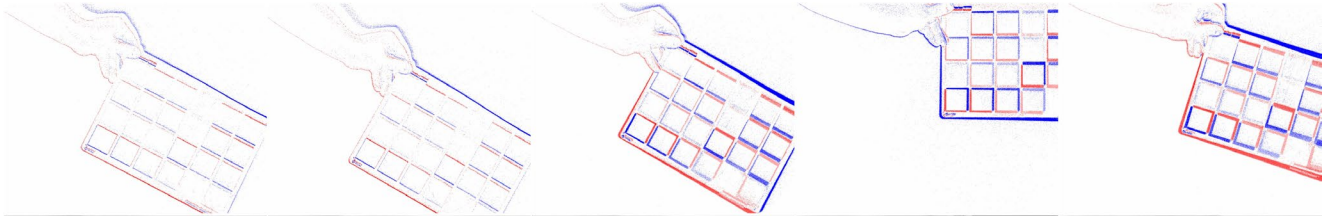


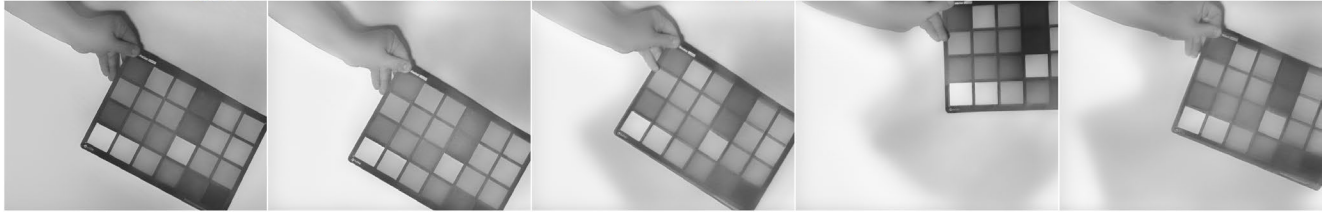
Figure S1-5: Comparison results of real-captured EVENTAID-R dataset (#5 R-ROOM1)

EVENTAID-R

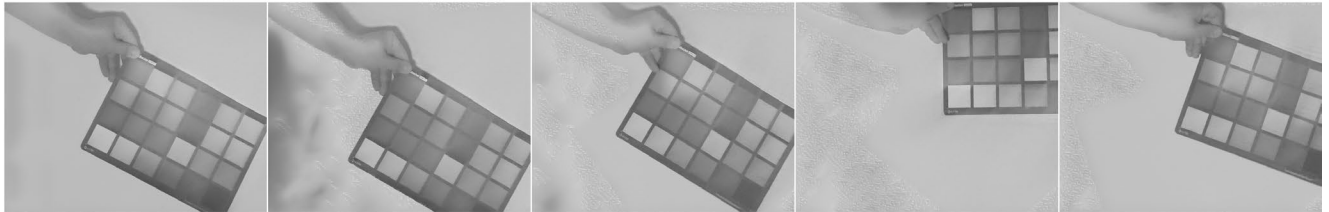
Event frame



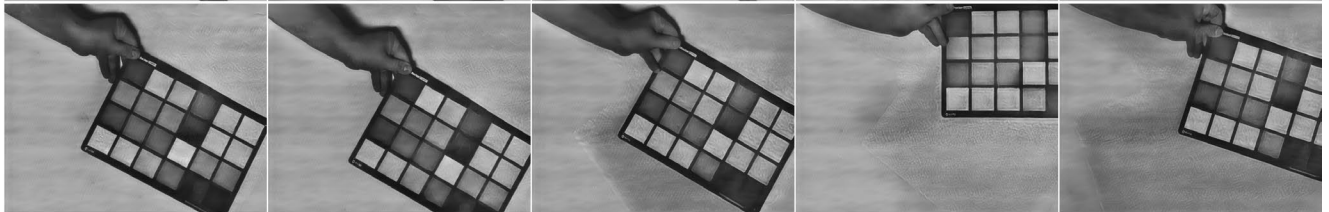
E2VID



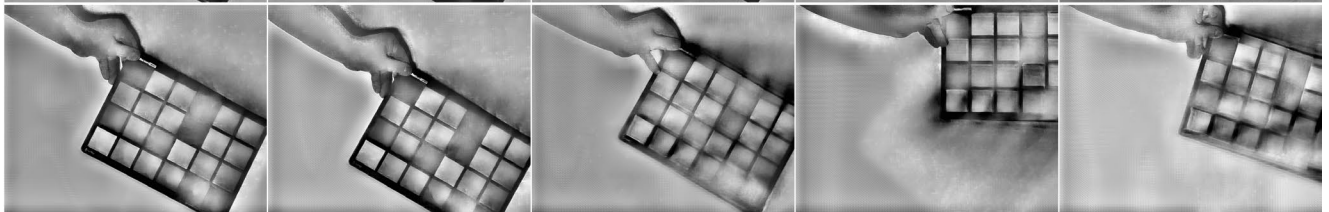
FireNet



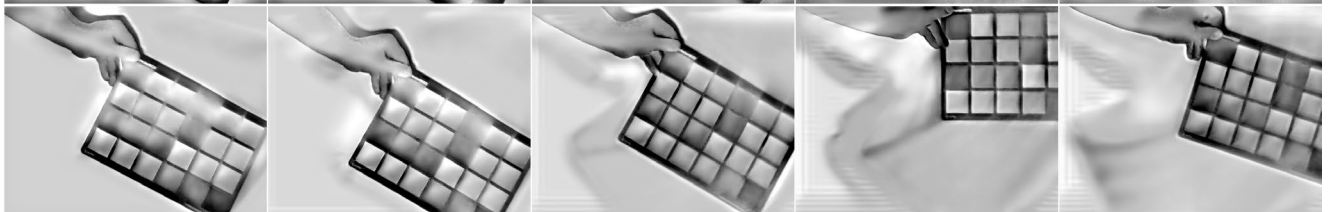
ET-Net



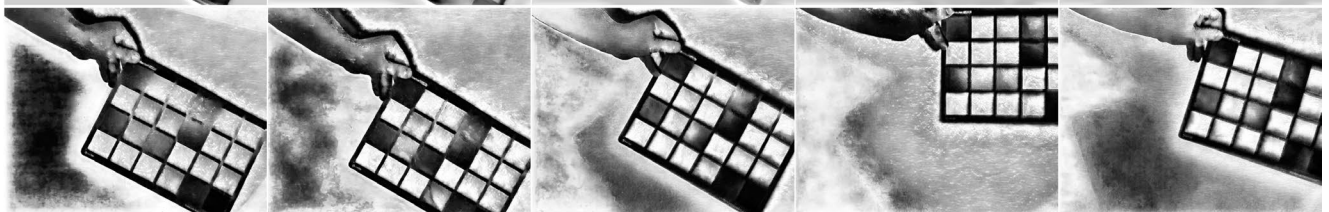
SPADE-E2VID



SSL-E2VID



EVSNN



Ground truth



Figure S1-6: Comparison results of real-captured EVENTAID-R dataset (#6 R-ROOM2)

EVENTAID-R

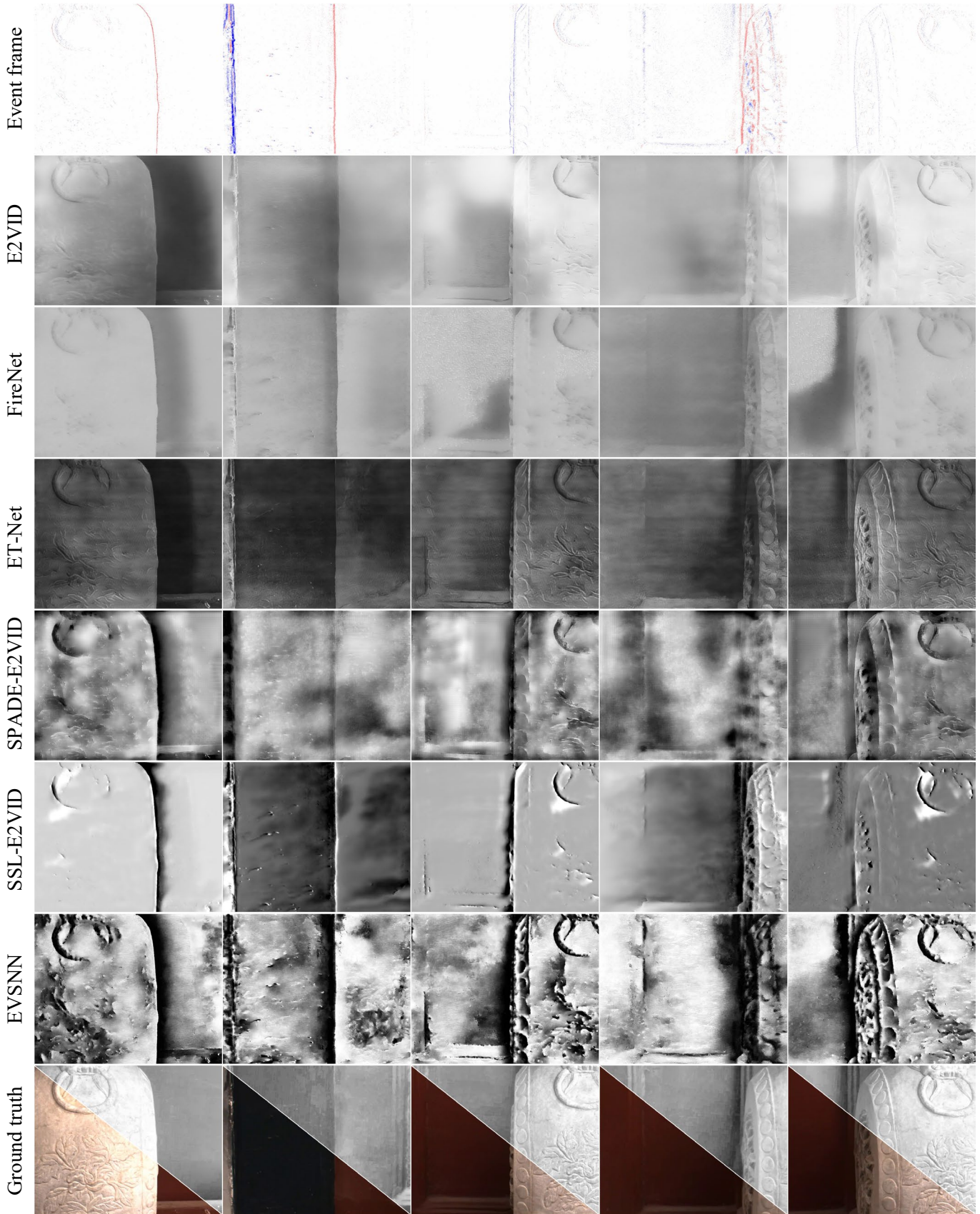


Figure S1-7: Comparison results of real-captured EVENTAID-R dataset (#7 R-SCULPTURE)

EVENTAID-R

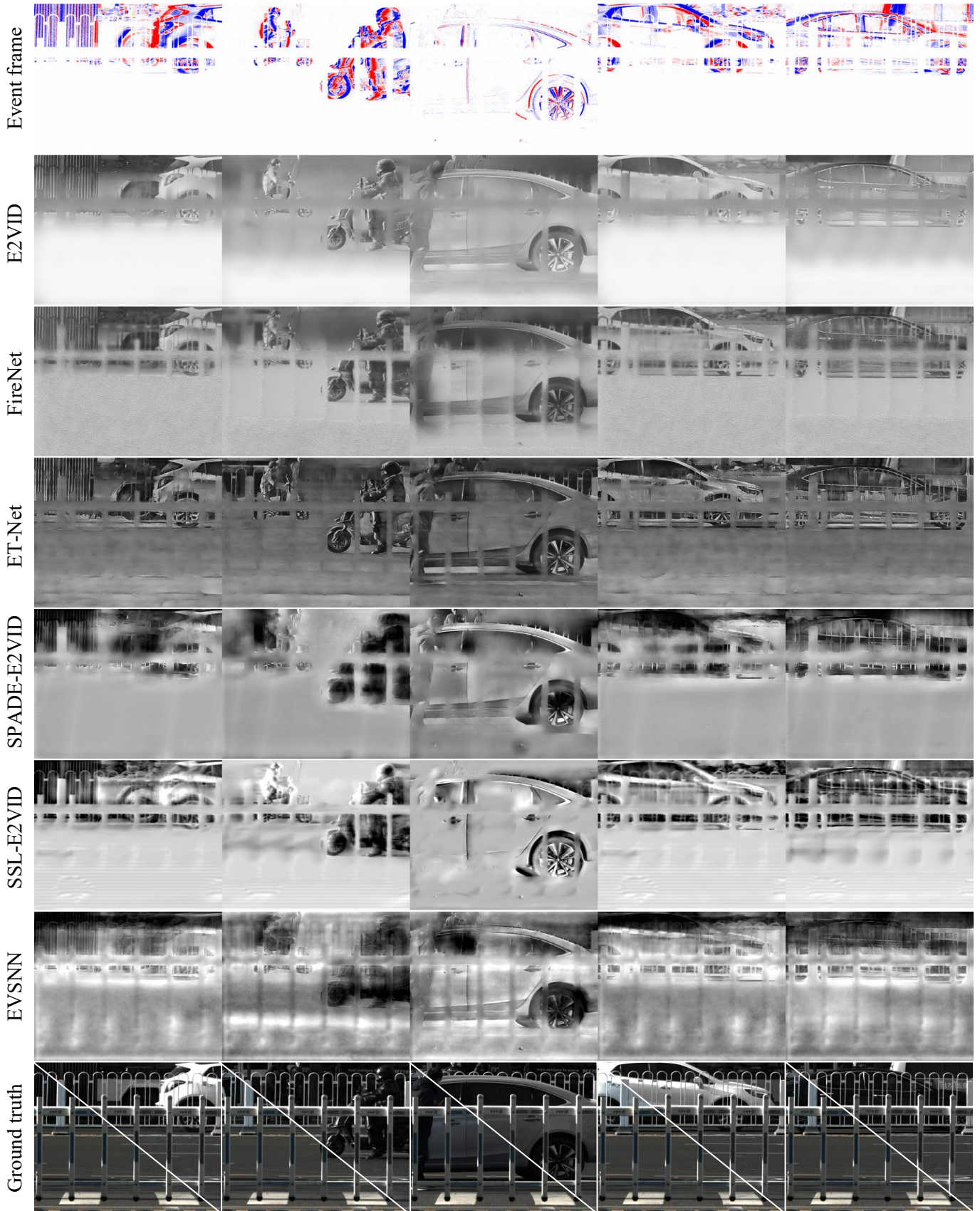


Figure S1-8: Comparison results of real-captured EVENTAID-R dataset (#8 R-TRAFFIC)

EVENTAID-R

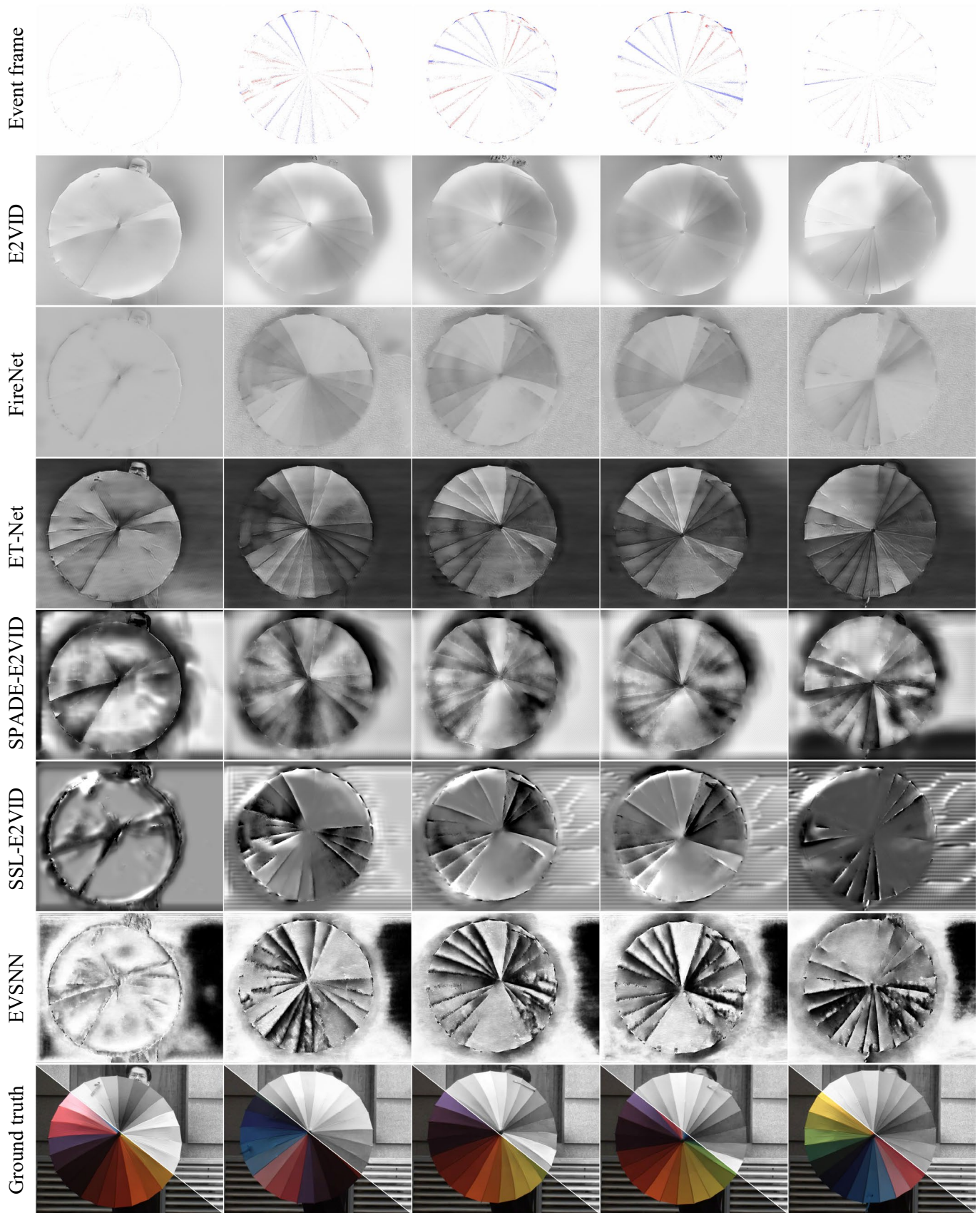


Figure S1-9: Comparison results of real-captured EVENTAID-R dataset (#9 R-UMBRELLA)

EVENTAID-R

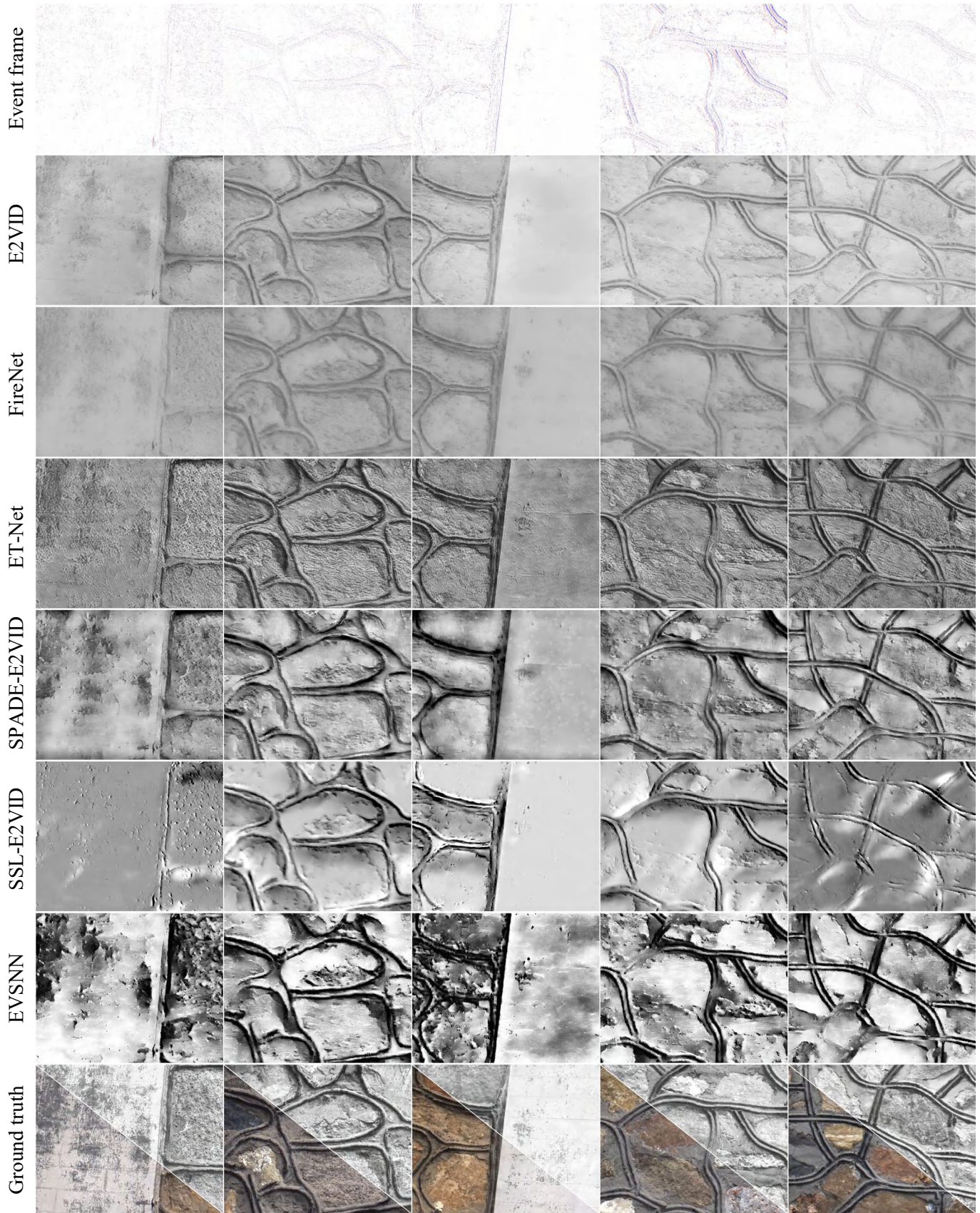


Figure S1-10: Comparison results of real-captured EVENTAID-R dataset (#10 R-WALL)

EVENTAID-R

Event frame

E2VID

FireNet

ET-Net

SPADE-E2VID

SSL-E2VID

EVSNN

Ground truth

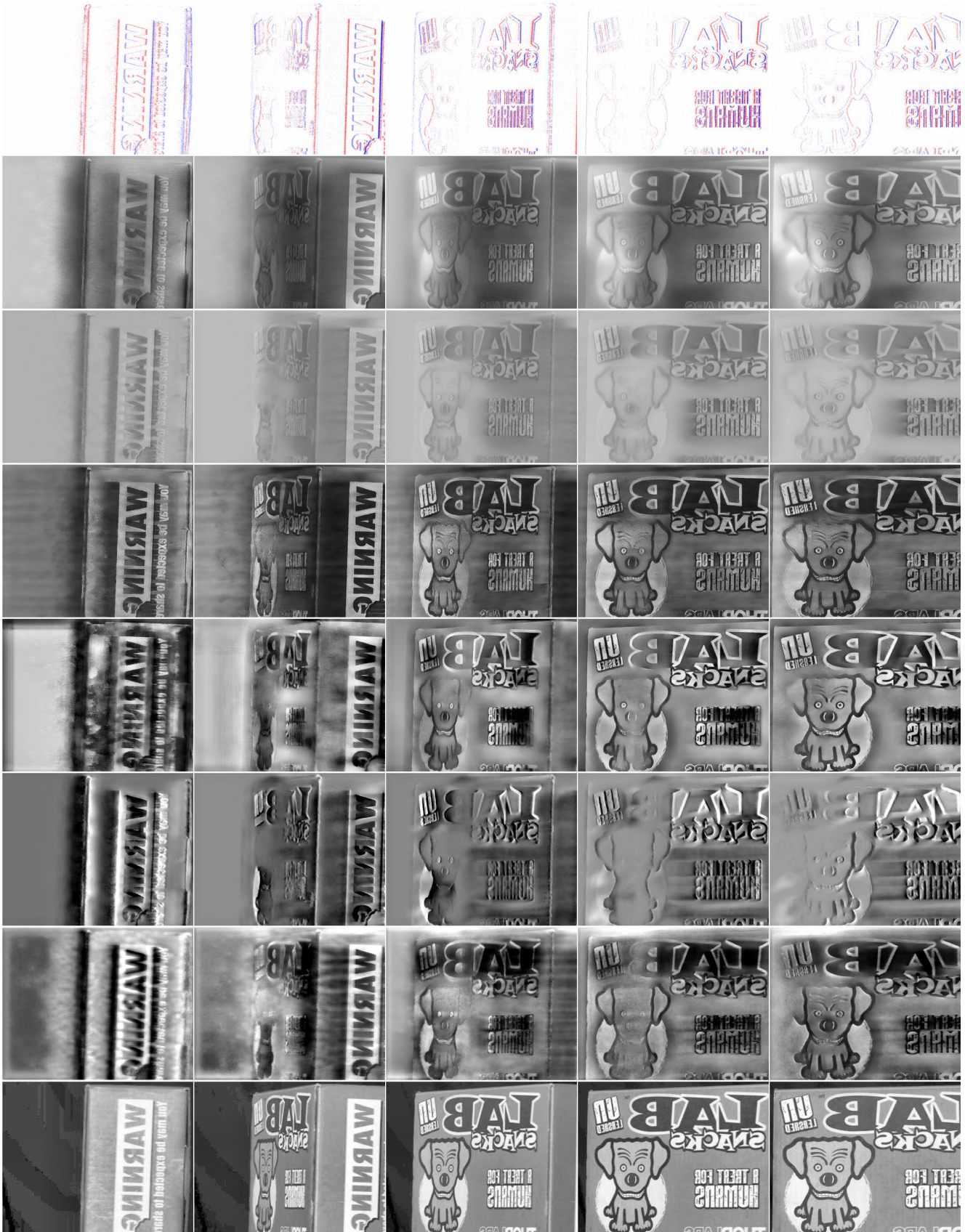


Figure S1-11: Comparison results of real-captured EVENTAID-R dataset (#11 R-BOX)

EVENTAID-R

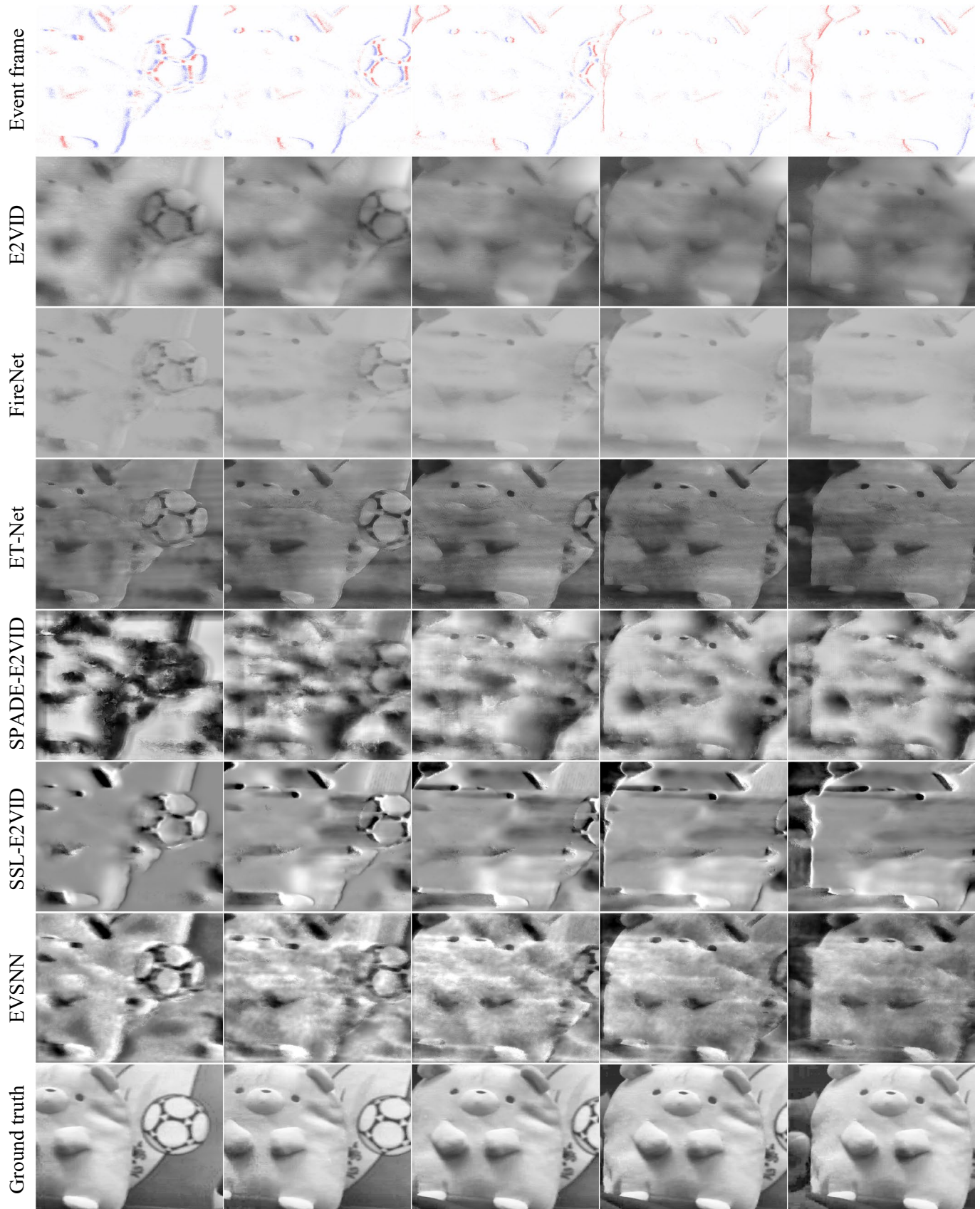


Figure S1-12: Comparison results of real-captured EVENTAID-R dataset (#12 R-BEAR)

EVENTAID-R

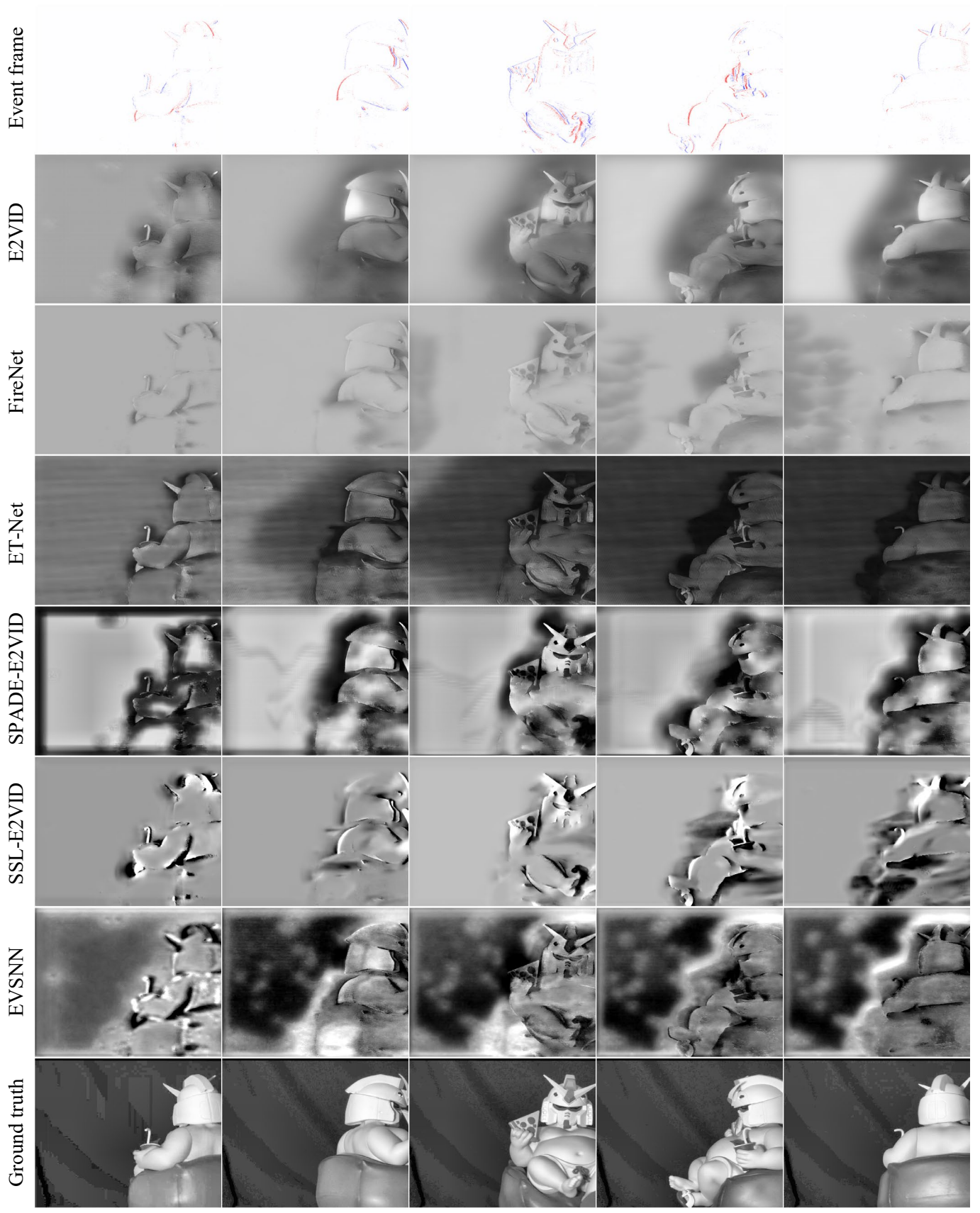


Figure S1-13: Comparison results of real-captured EVENTAID-R dataset (#13 R-TOY)

EVENTAID-R

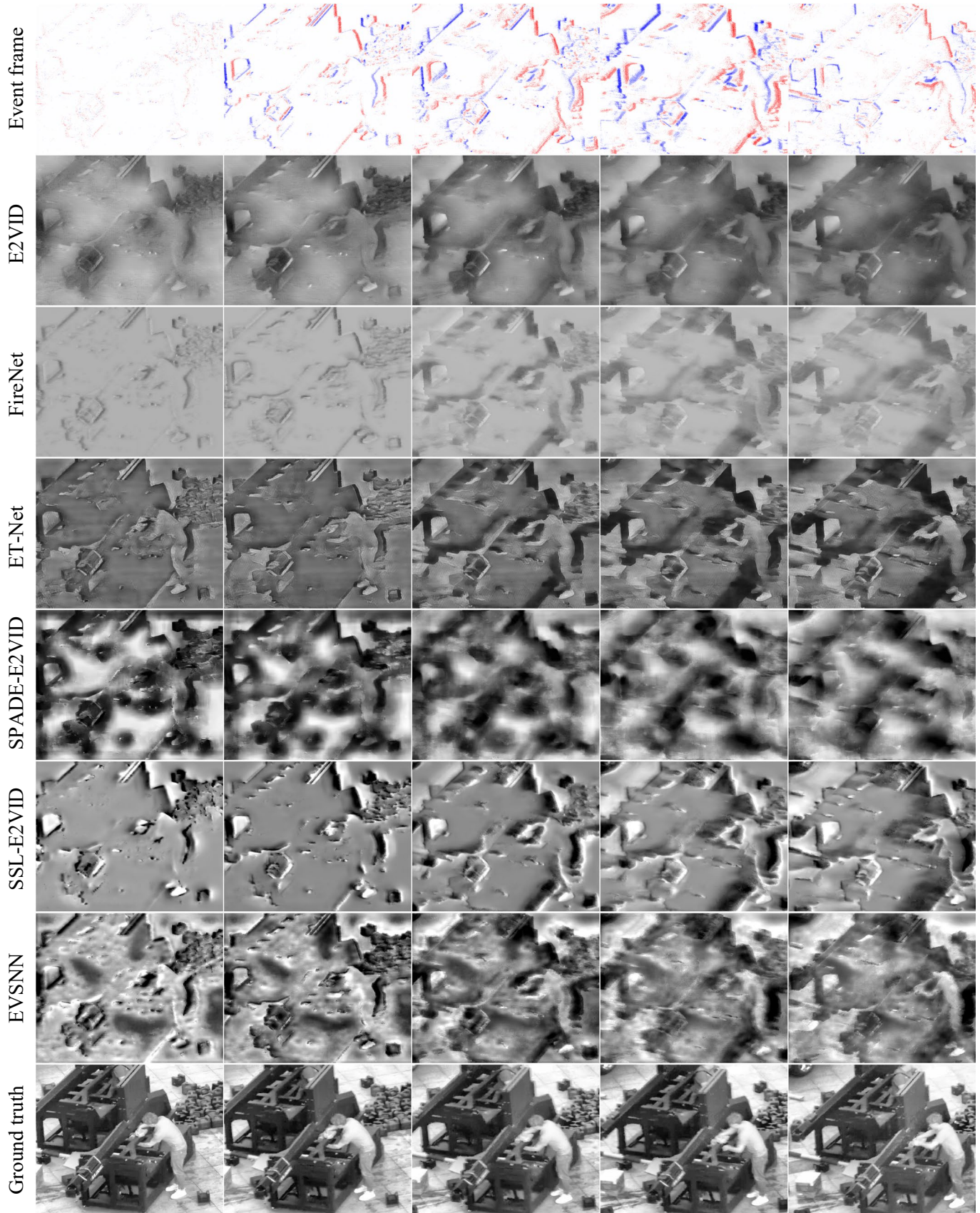


Figure S1-14: Comparison results of real-captured EVENTAID-R dataset (#14 R-OUTDOOR)

1.2 Results on simulated EVENTAID-R-V2E dataset

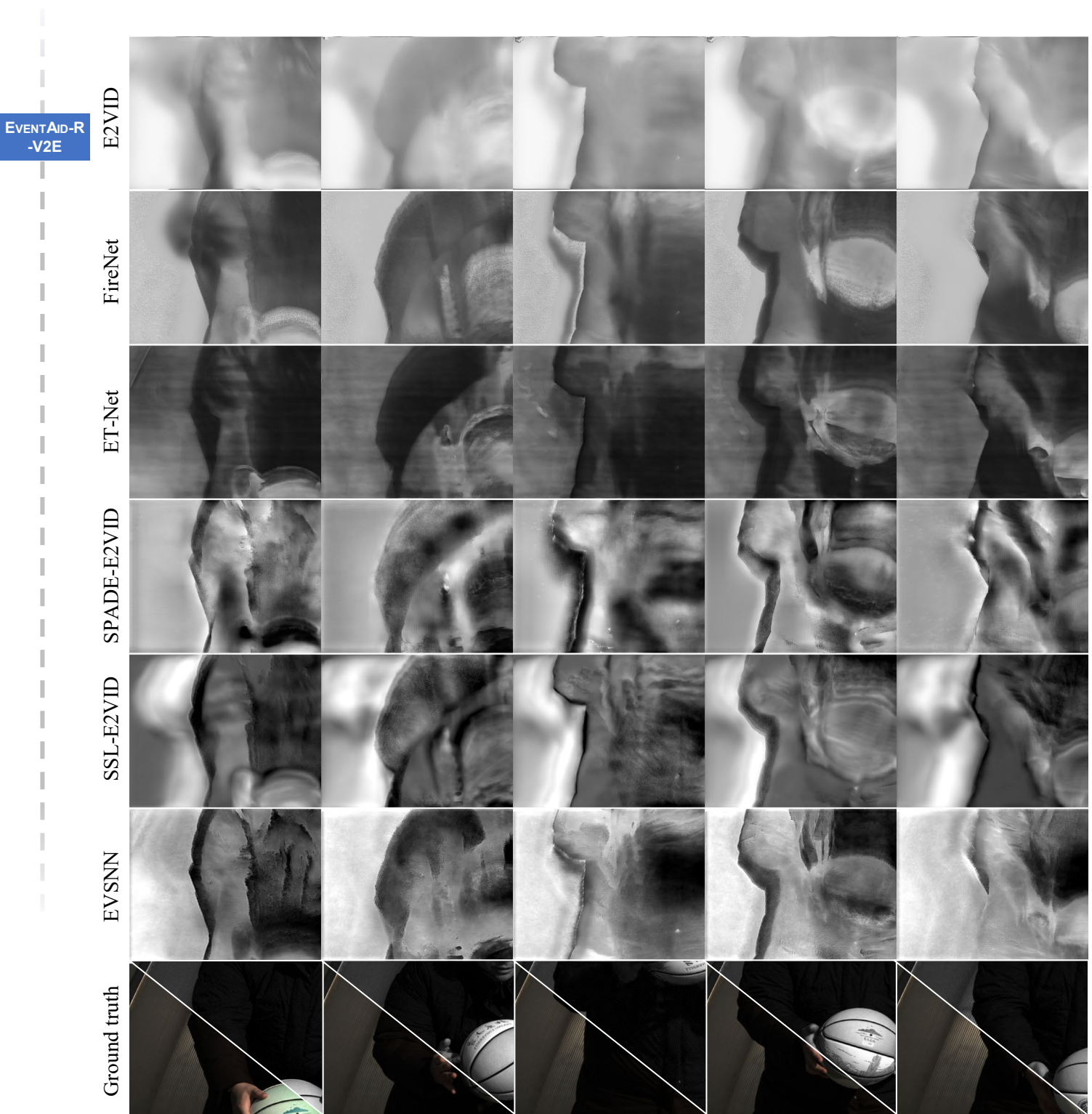


Figure S1-15: Comparison results of simulated EVENTAID-R-V2E dataset (#1 R-BALL)

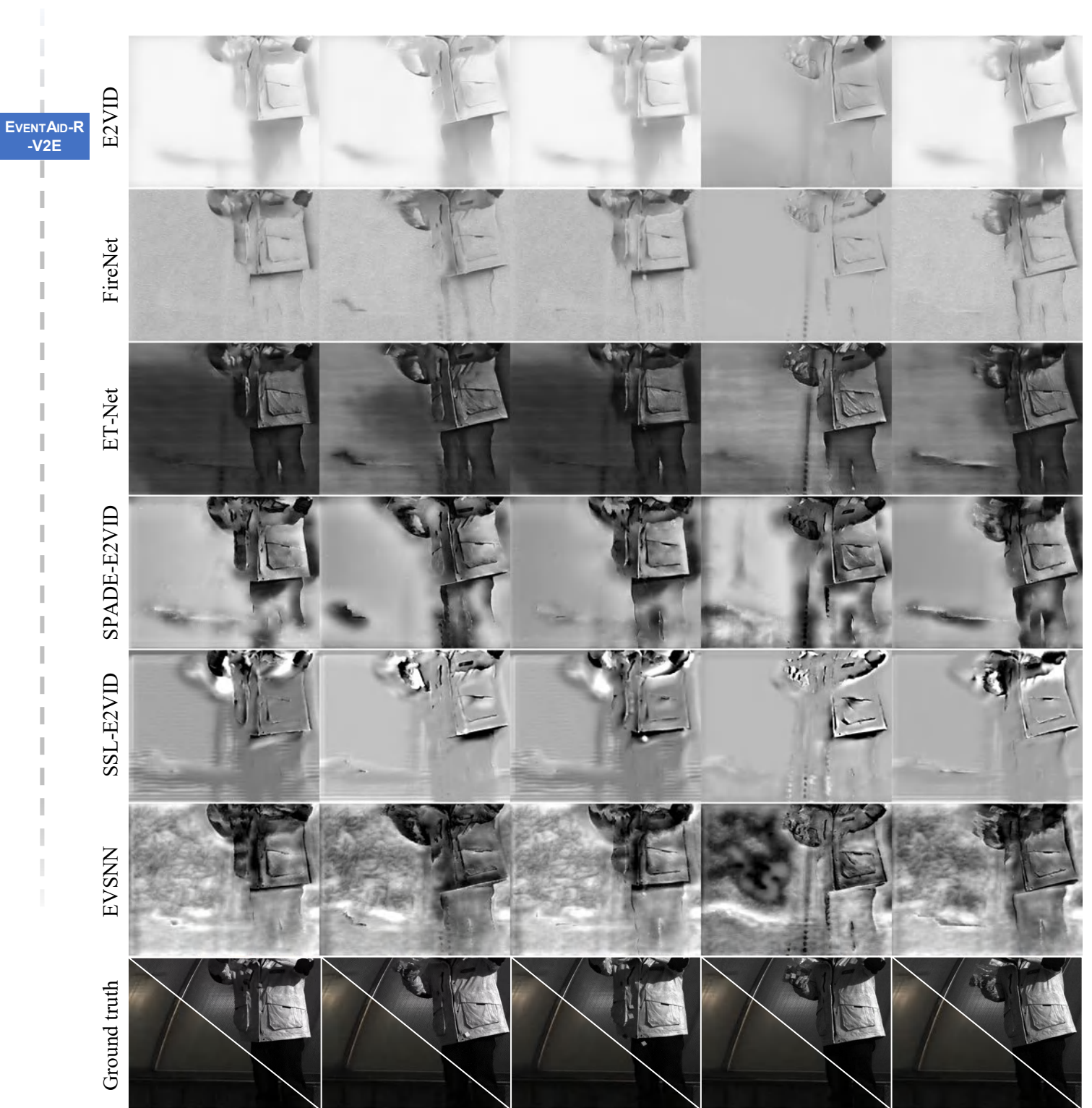


Figure S1-16: Comparison results of simulated EVENTAID-R-V2E dataset (#2 R-BLOCKS)

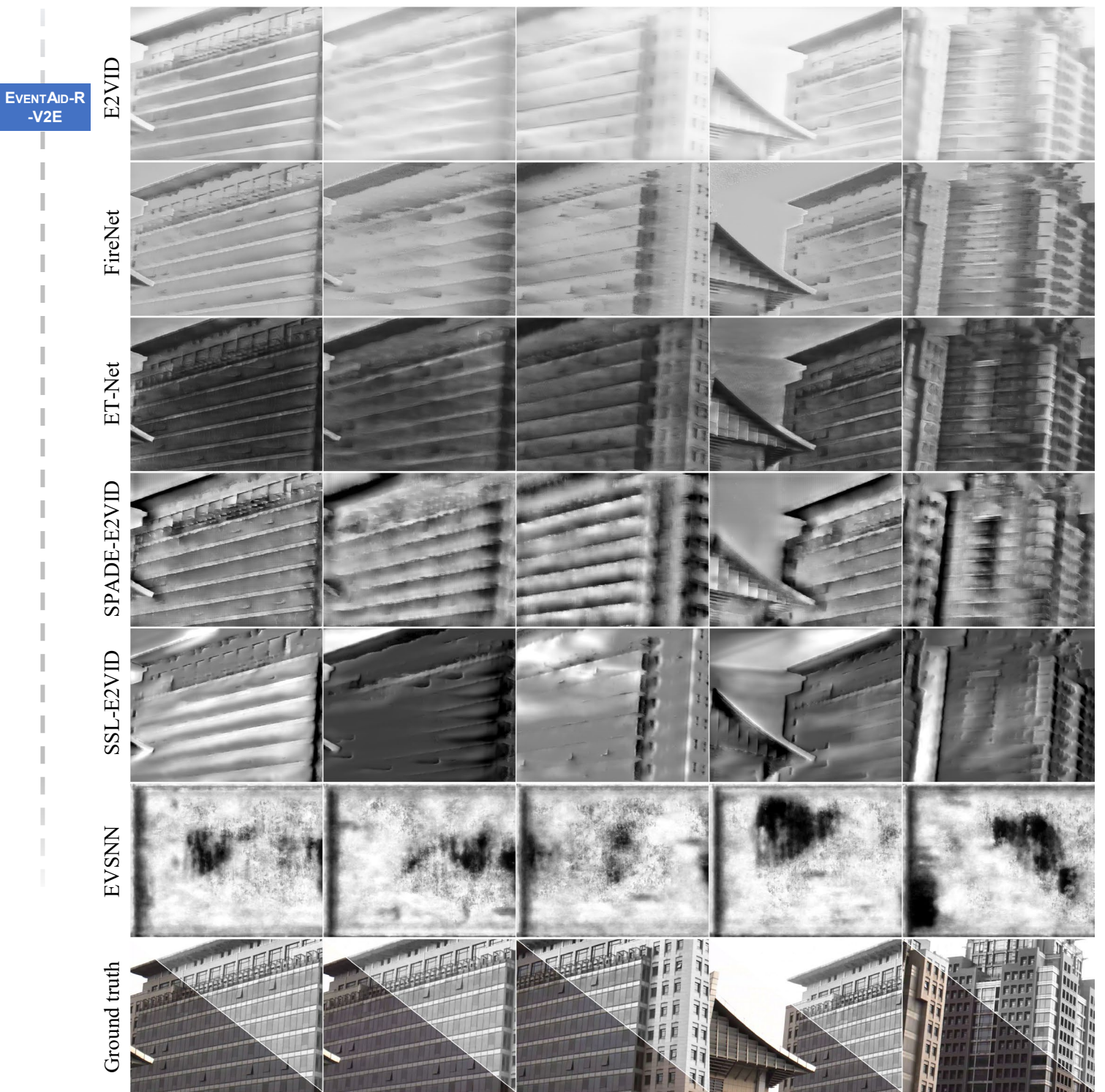


Figure S1-17: Comparison results of simulated EVENTAID-R-V2E dataset (#3 R-BUILDING)

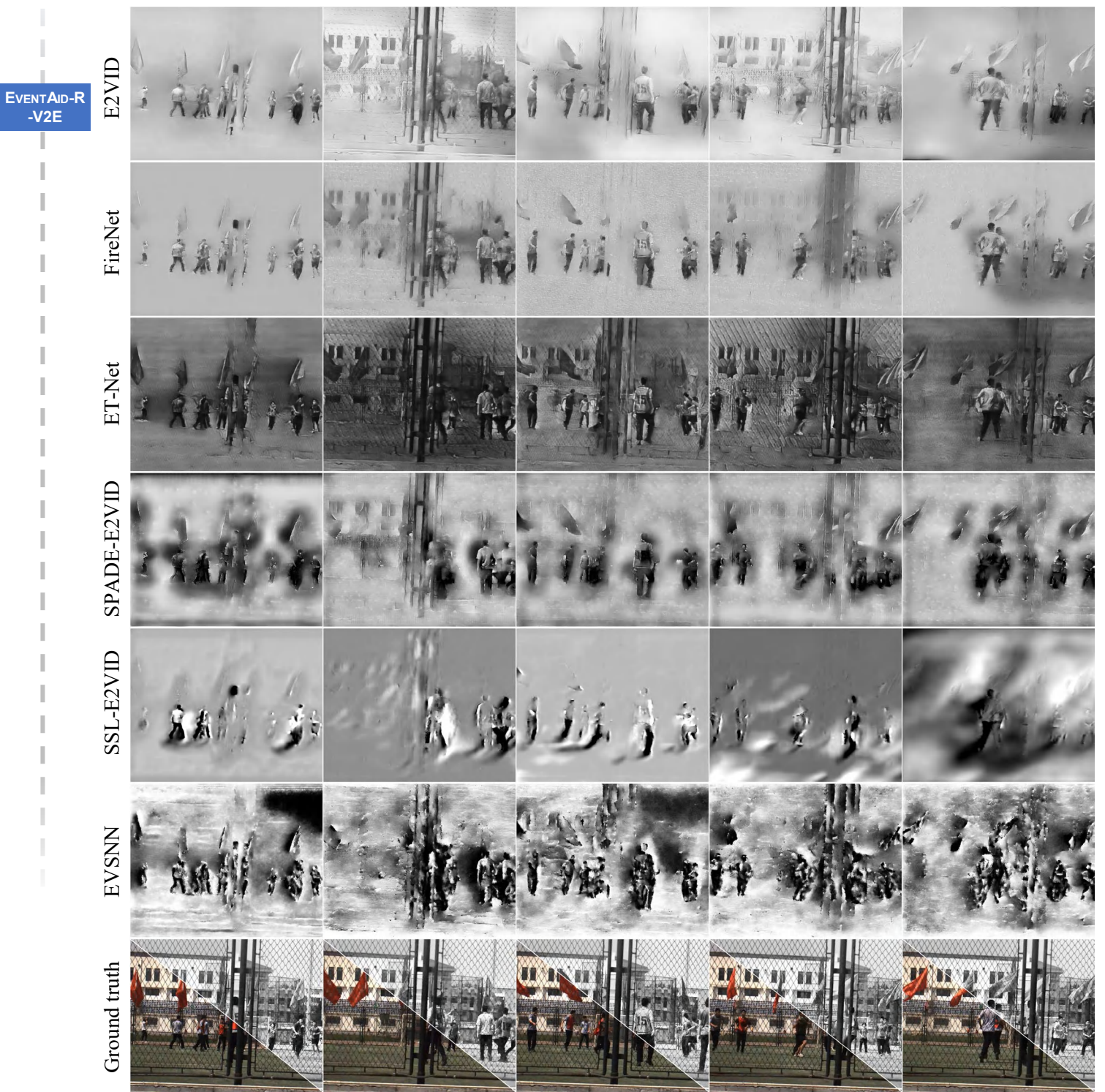


Figure S1-18: Comparison results of simulated EVENTAID-R-V2E dataset (#4 R-PLAYBALL)

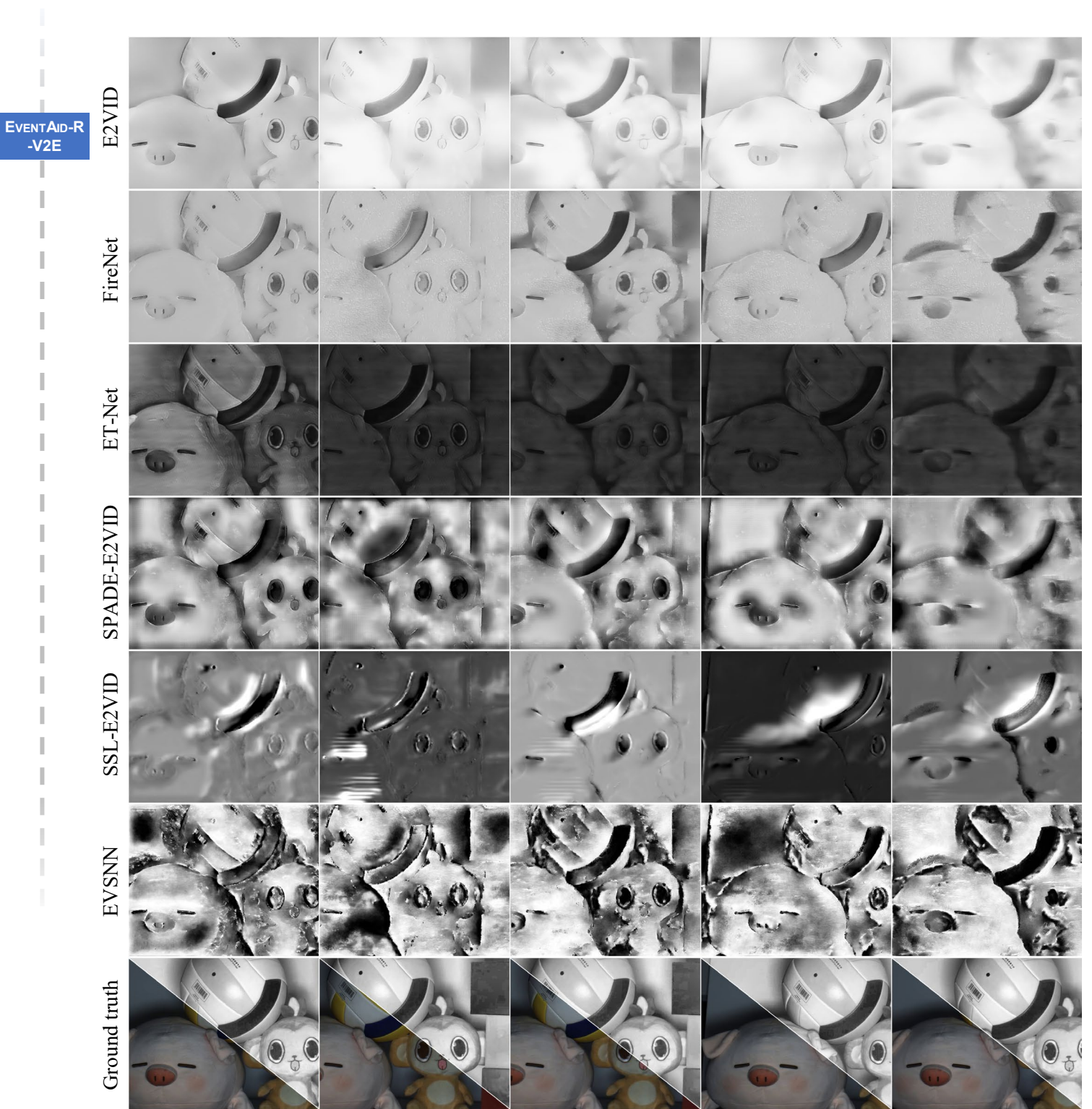


Figure S1-19: Comparison results of simulated EVENTAID-R-V2E dataset (#5 R-ROOM1)

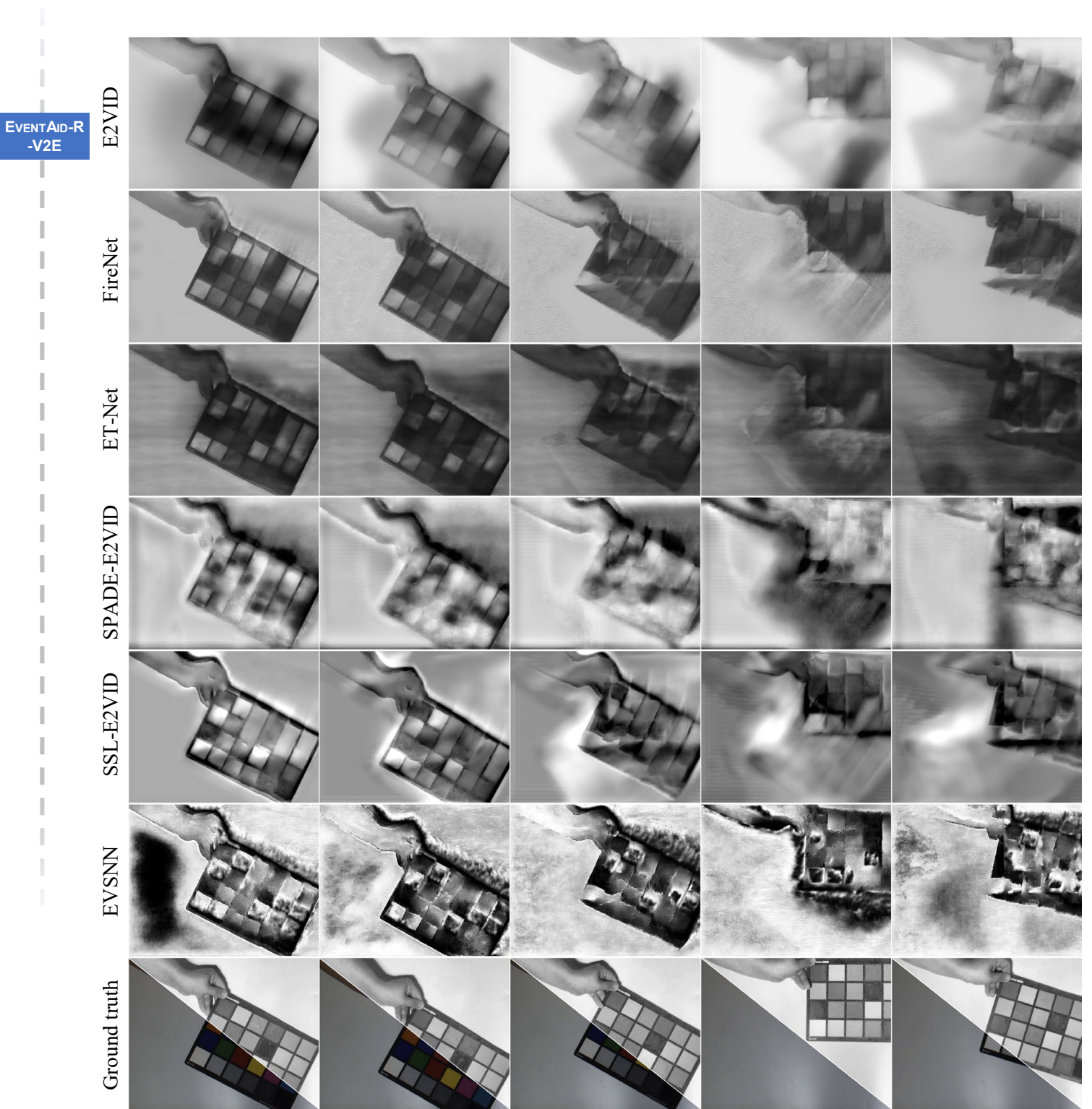


Figure S1-20: Comparison results of simulated EVENTAID-R-V2E dataset (#6 R-ROOM2)

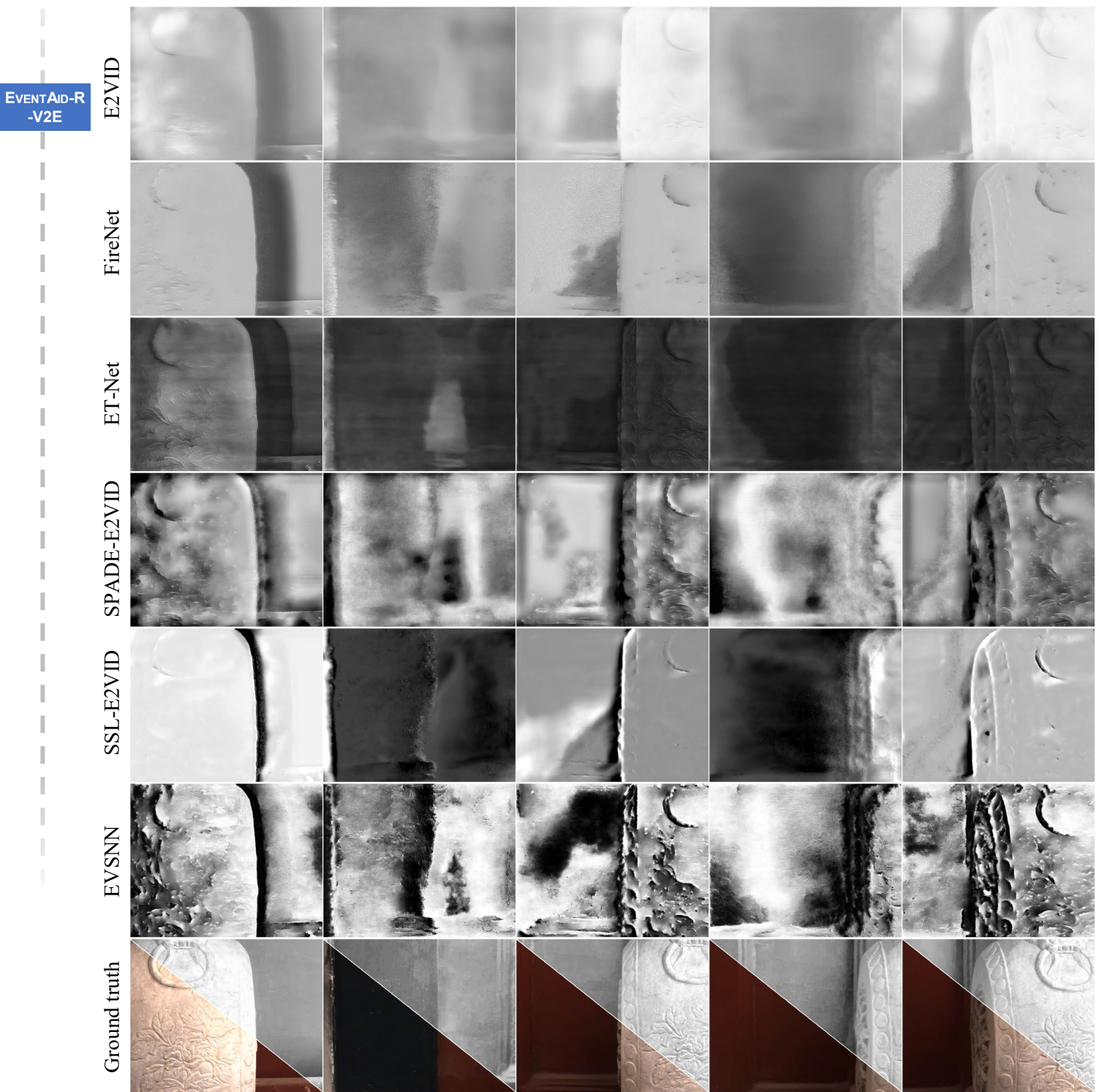


Figure S1-21: Comparison results of simulated EVENTAID-R-V2E dataset (#7 R-SCULPTURE)

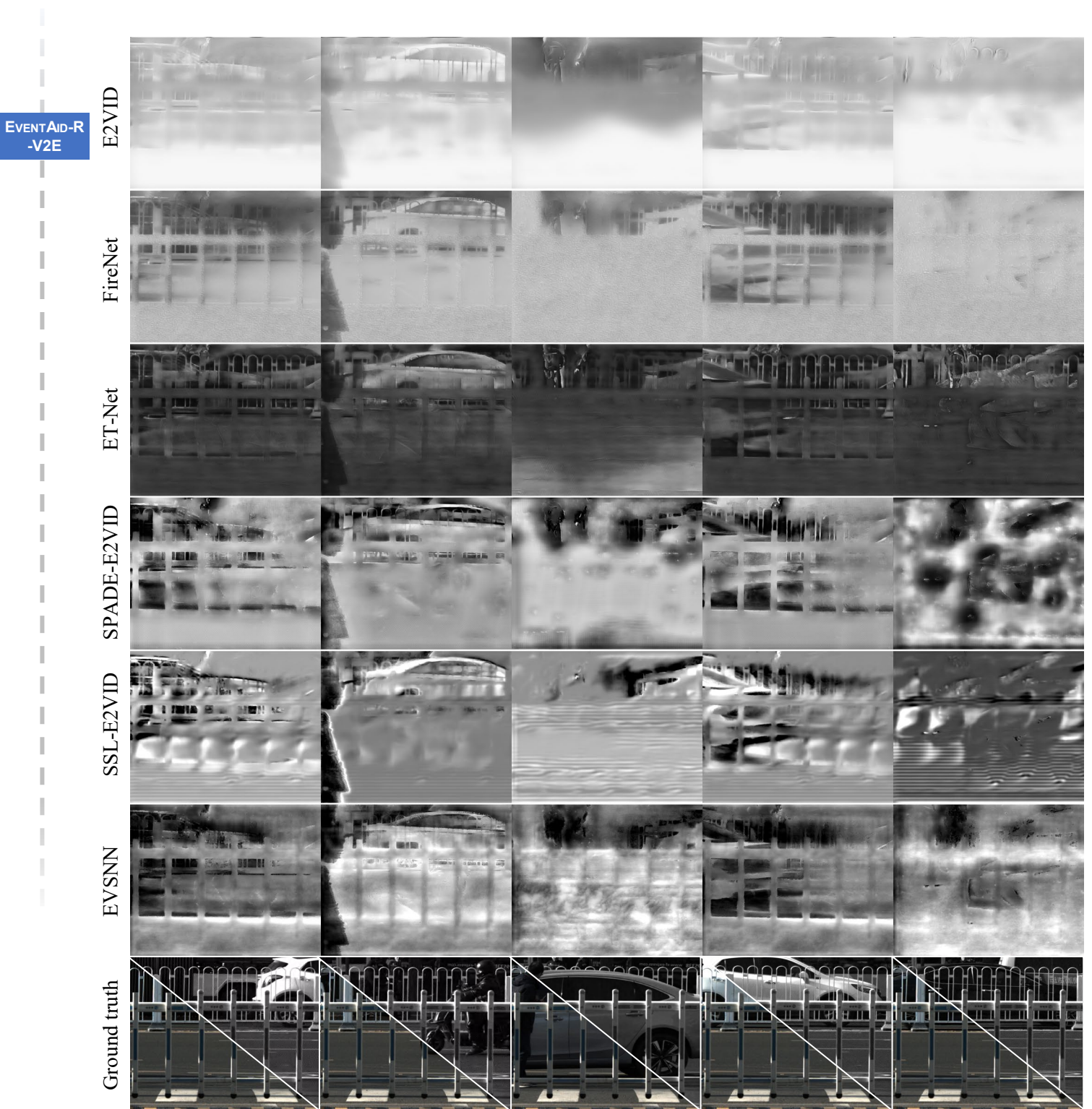


Figure S1-22: Comparison results of simulated EVENTAID-R-V2E dataset (#8 R-TRAFFIC)

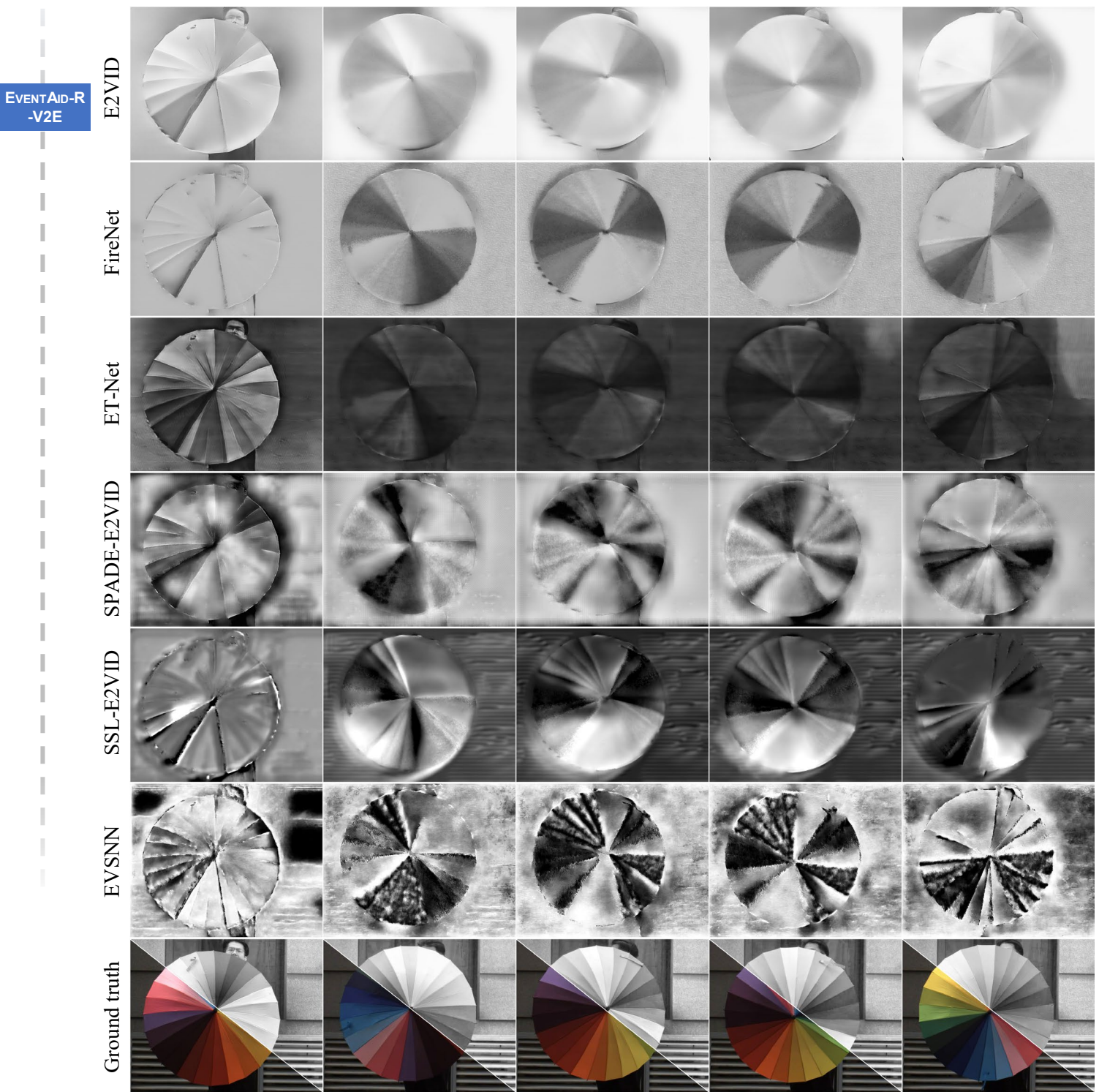


Figure S1-23: Comparison results of simulated EVENTAID-R-V2E dataset (#9 R-UMBRELLA)

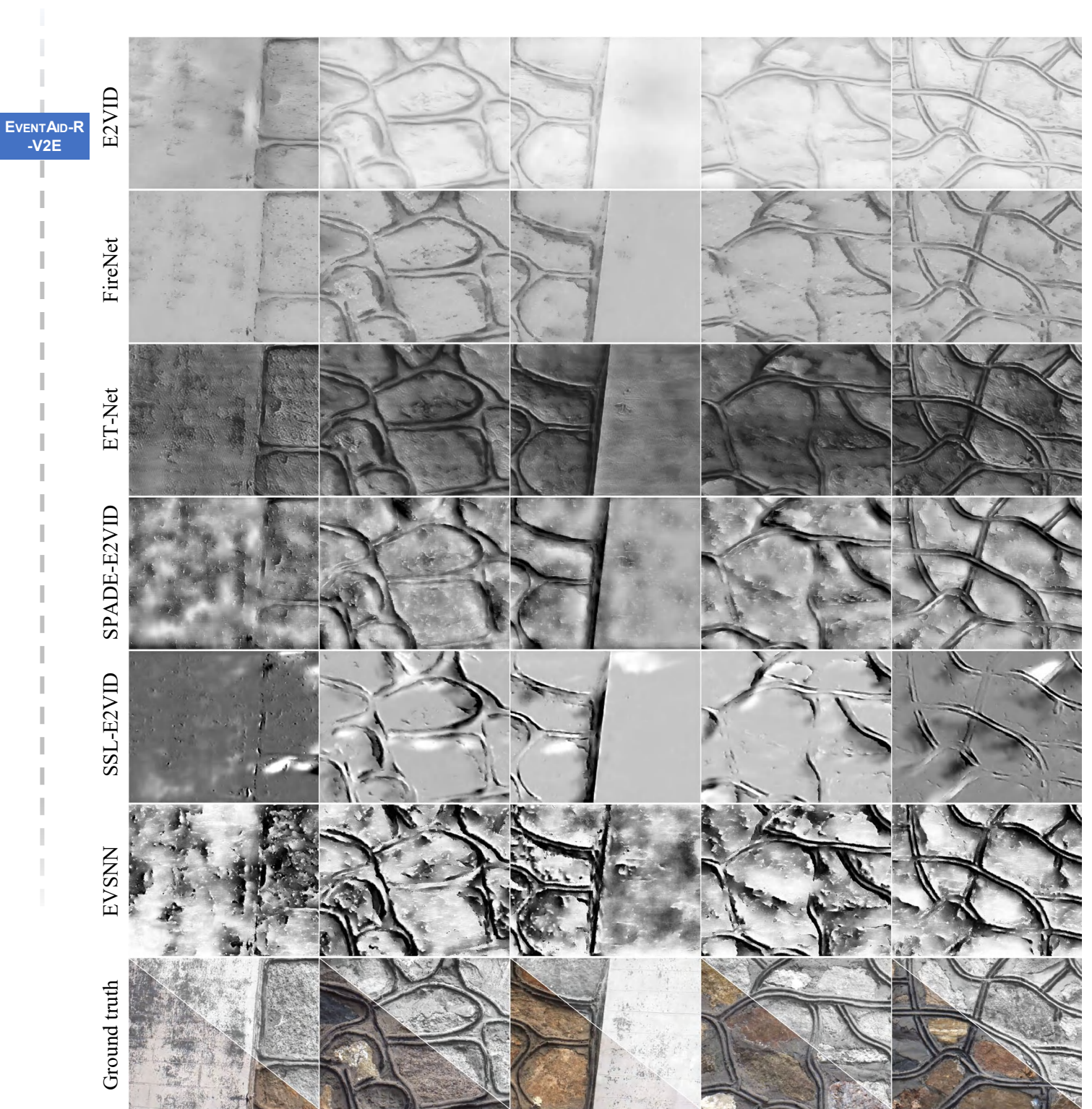


Figure S1-24: Comparison results of simulated EVENTAID-R-V2E dataset (#10 R-WALL)



Figure S1-25: Comparison results of simulated EVENTAID-R-V2E dataset (#11 R-BOX)

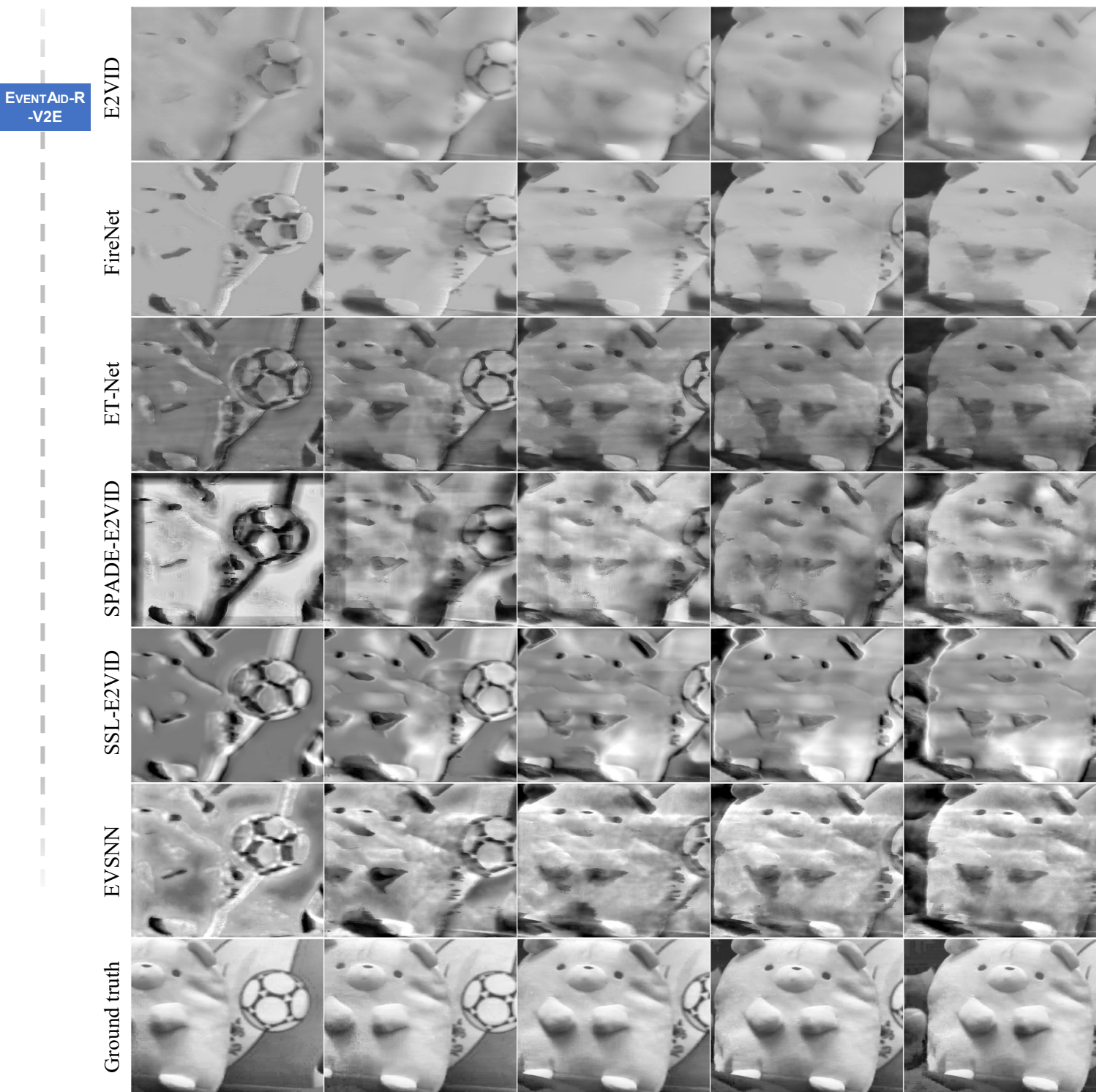


Figure S1-26: Comparison results of simulated EVENTAID-R-V2E dataset (#12 R-BEAR)

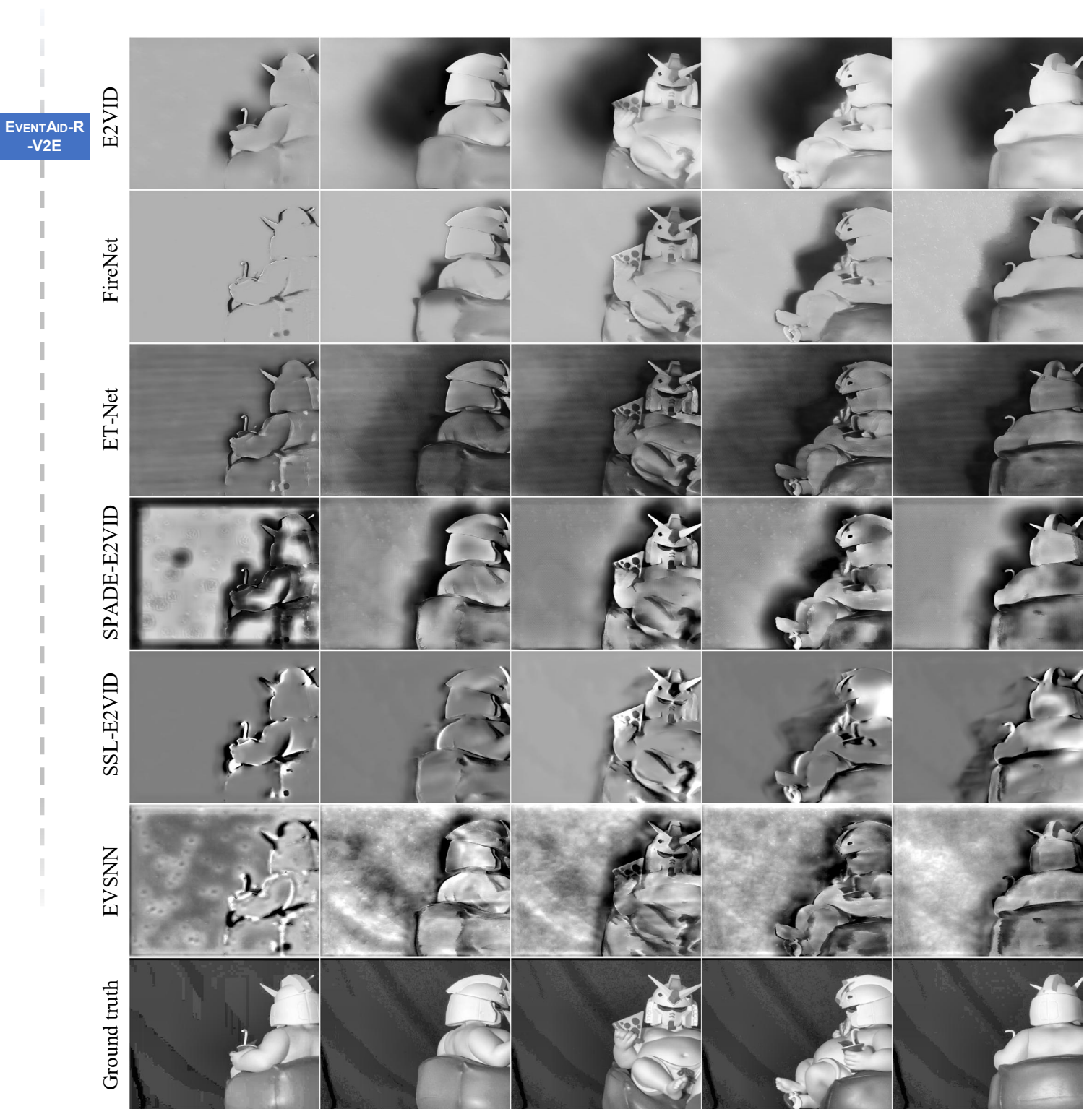


Figure S1-27: Comparison results of simulated EVENTAID-R-V2E dataset (#13 R-TOY)

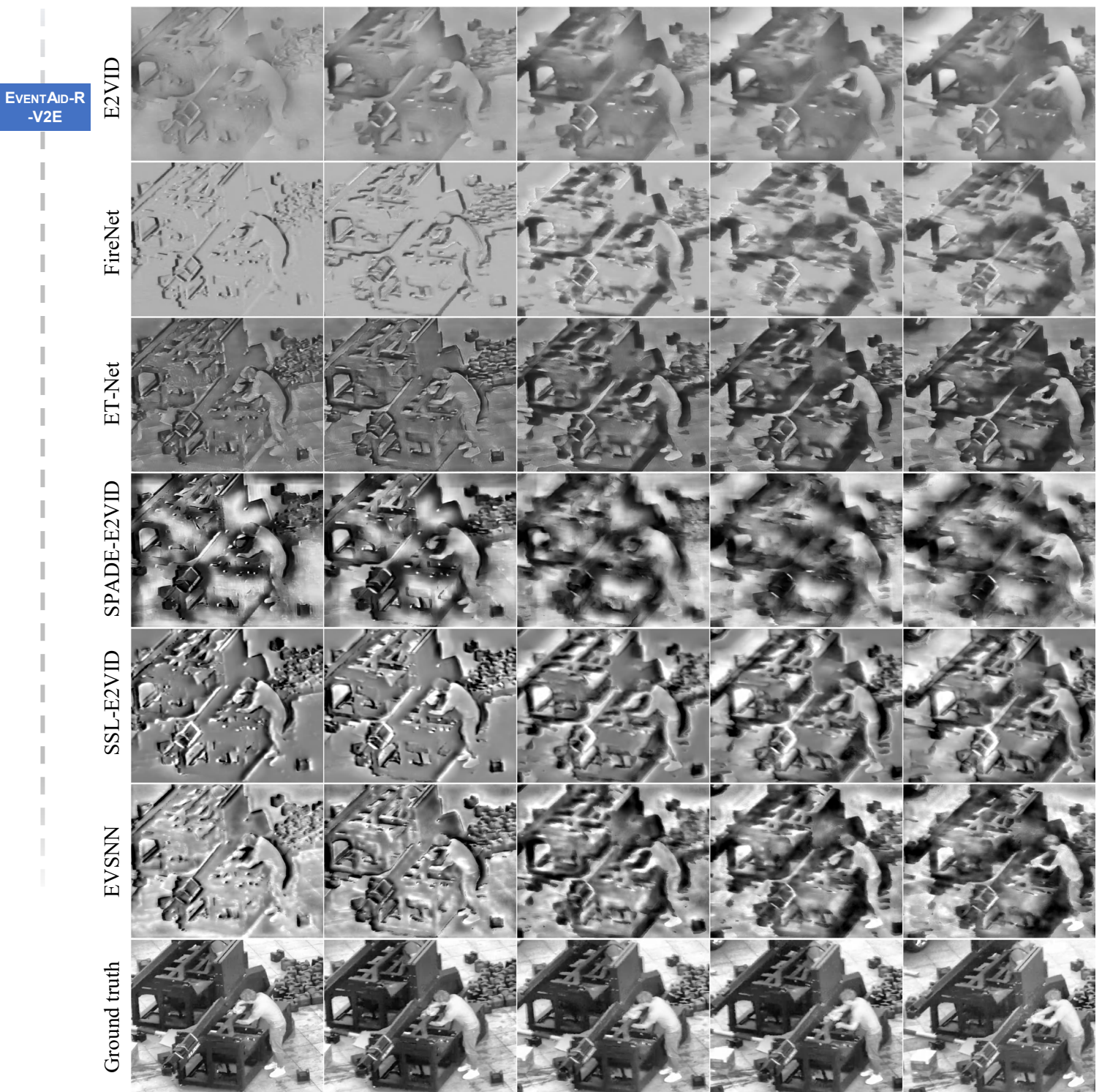


Figure S1-28: Comparison results of simulated EVENTAID-R-V2E dataset (#14 R-OUTDOOR)

1.3 Results on simulated EVENTAID-R-VM dataset

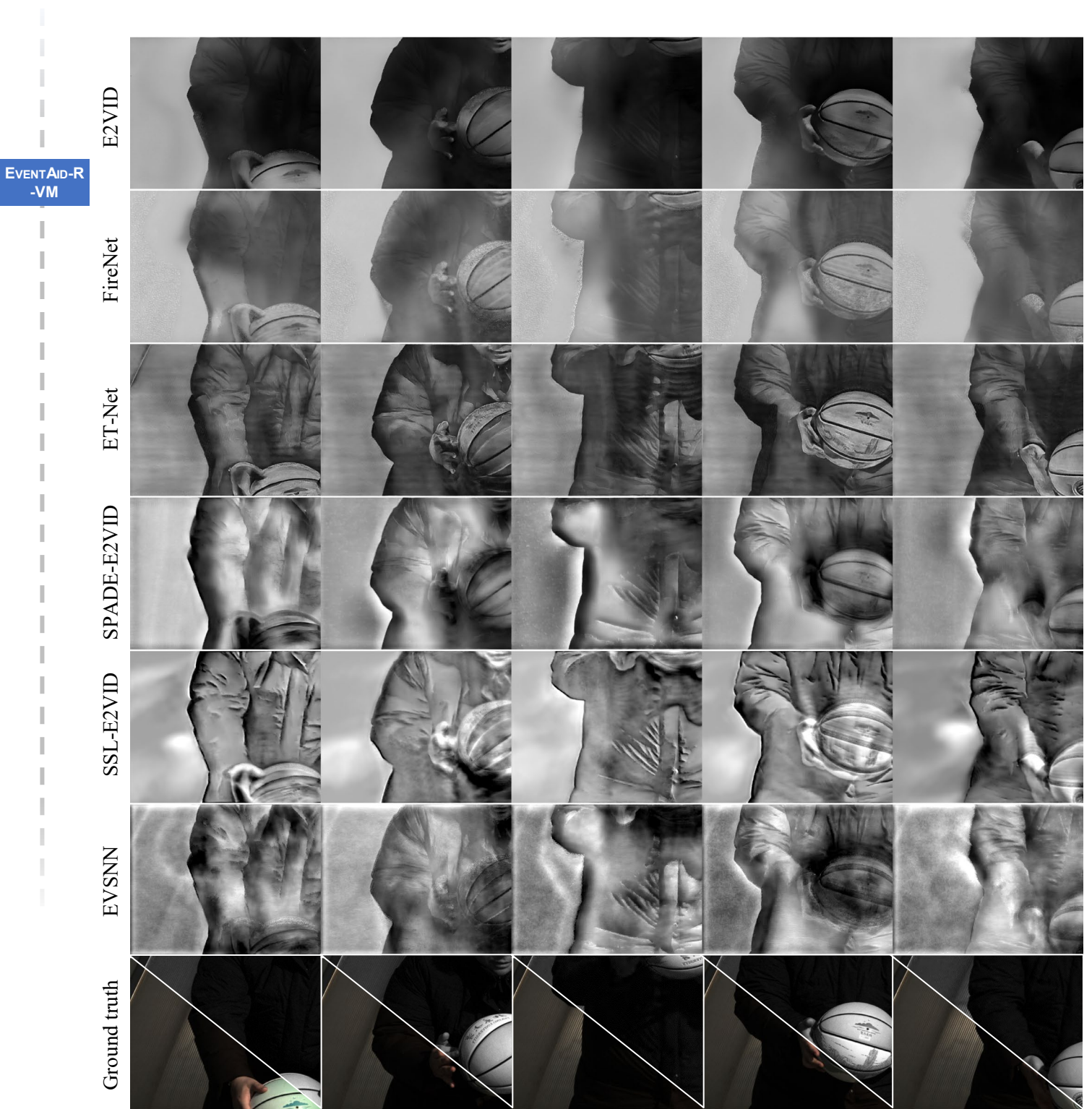


Figure S1-29: Comparison results of simulated EVENTAID-R-VM dataset (#1 R-BALL)

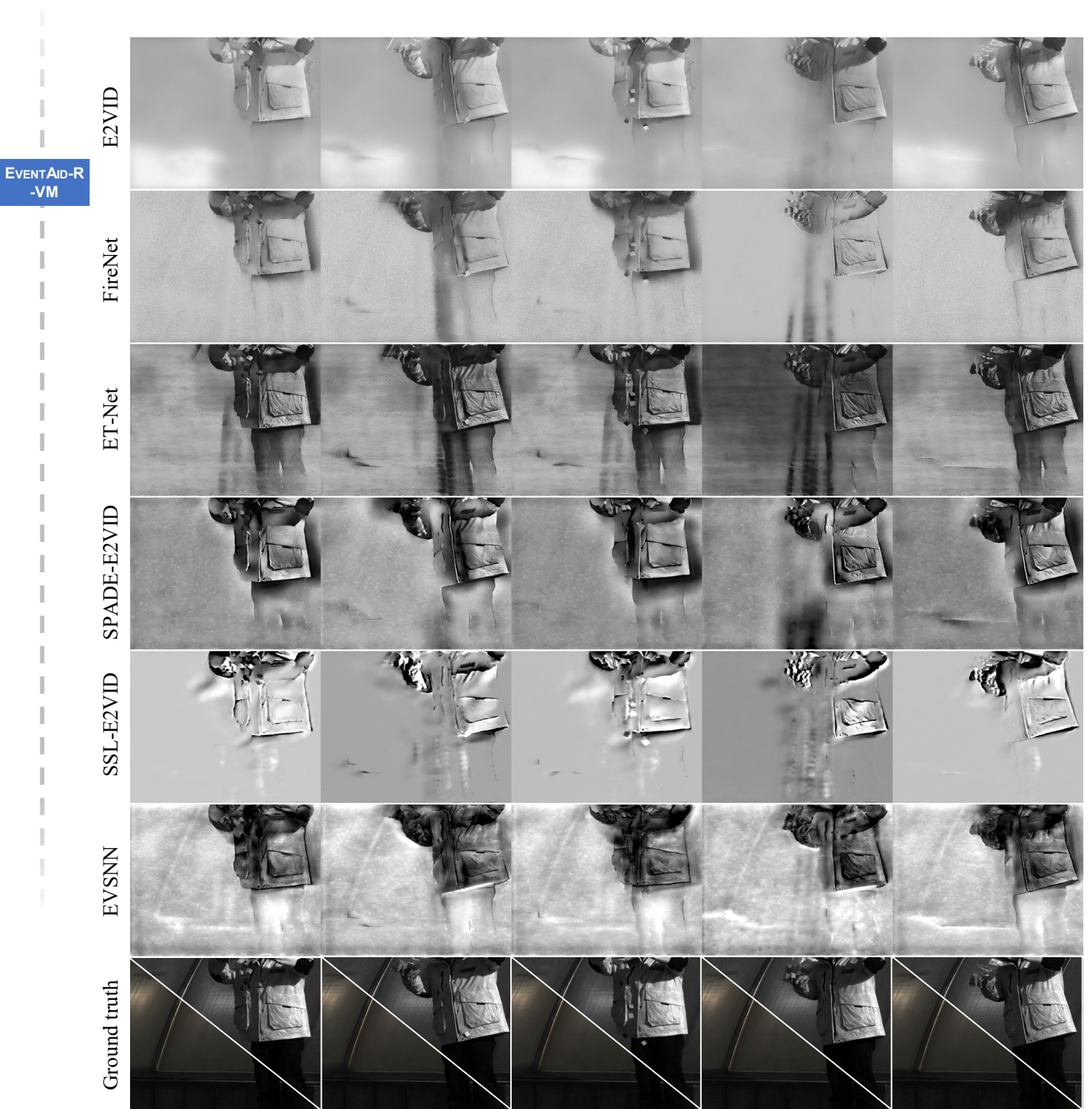


Figure S1-30: Comparison results of simulated EVENTAID-R-VM dataset (#2 R-BLOCKS)

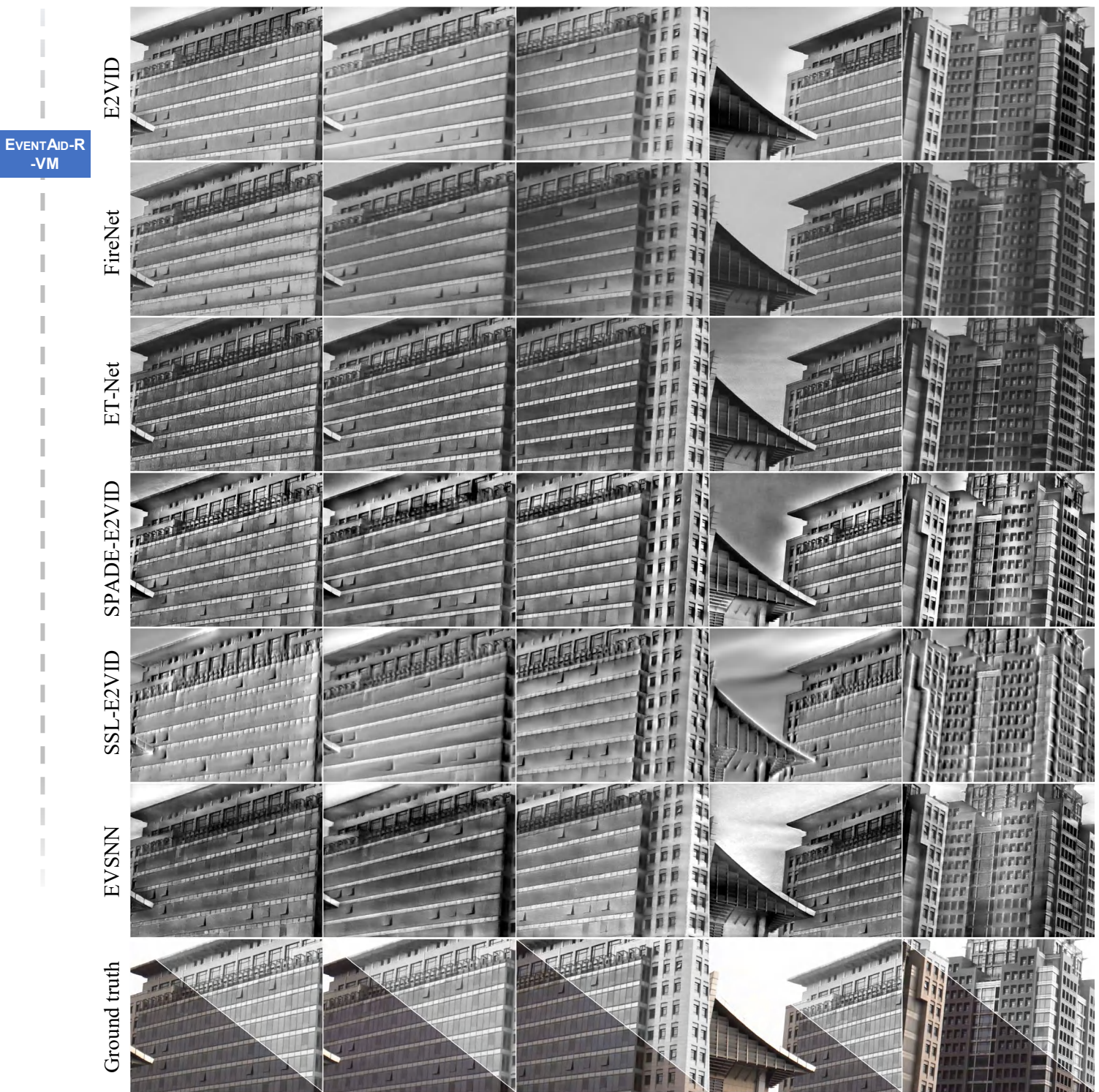


Figure S1-31: Comparison results of simulated EVENTAID-R-VM dataset (#3 R-BUILDING)

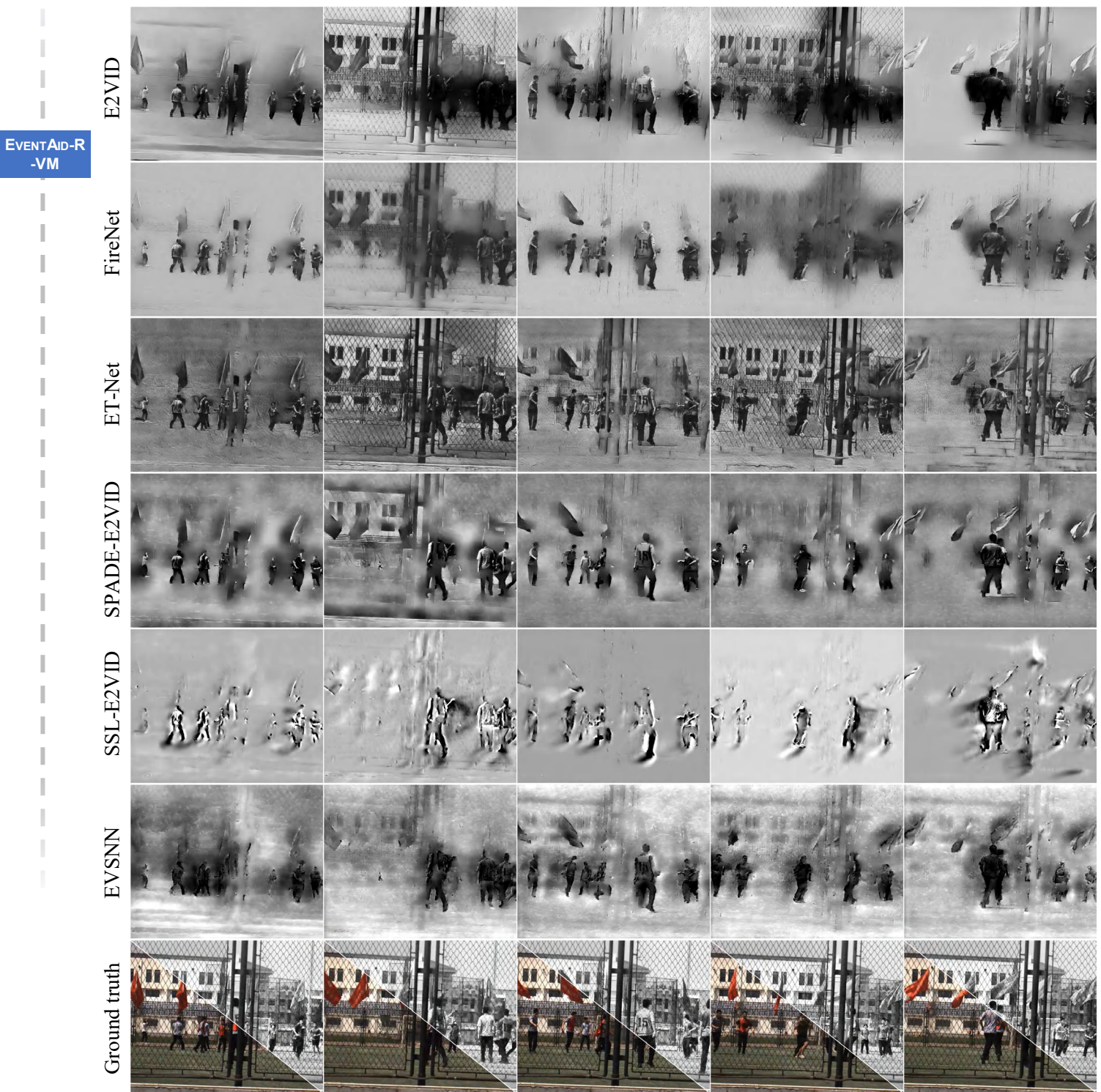


Figure S1-32: Comparison results of simulated EVENTAID-R-VM dataset (#4 R-PLAYBALL)

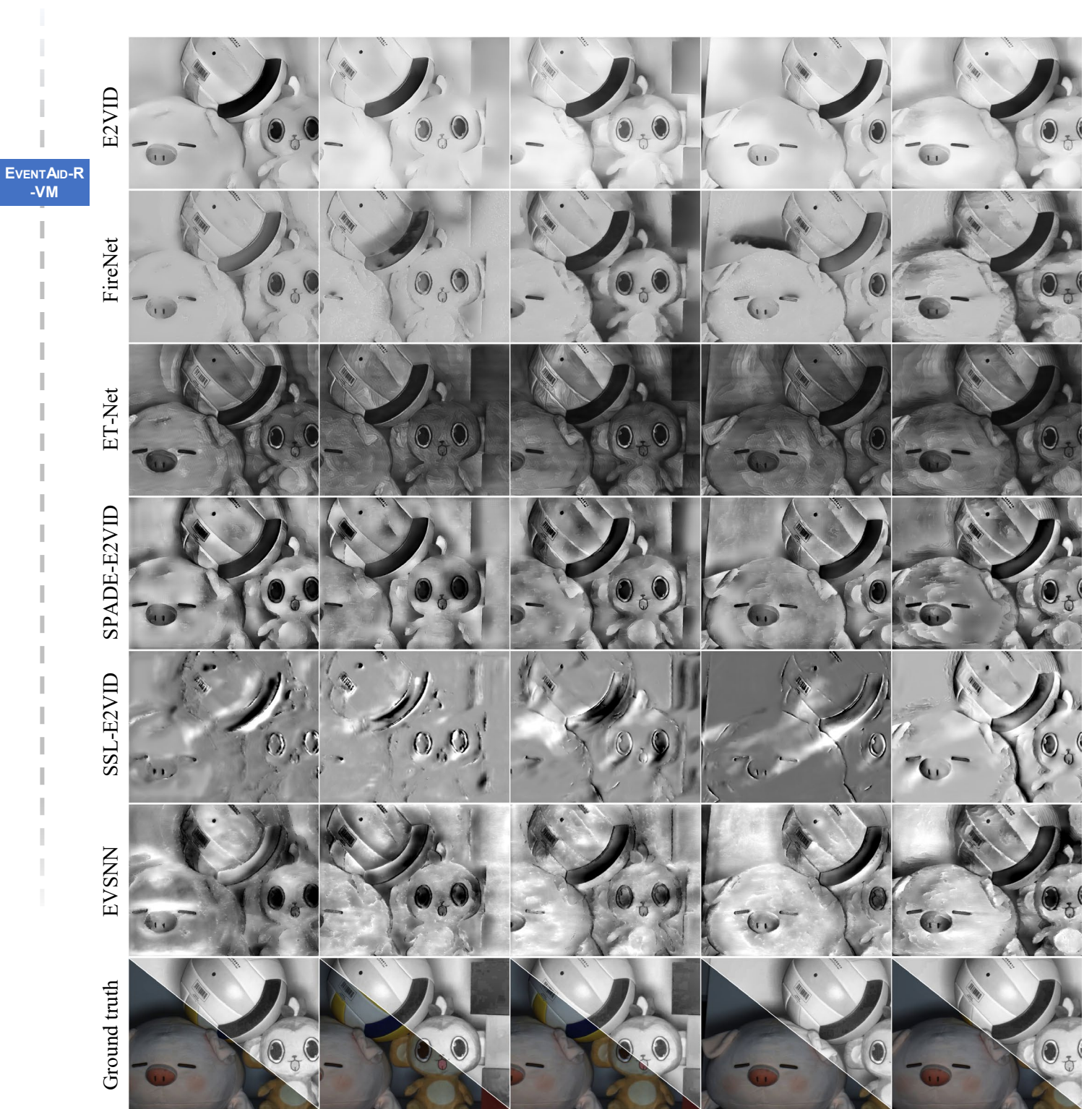


Figure S1-33: Comparison results of simulated EVENTAID-R-VM dataset (#5 R-ROOM1)

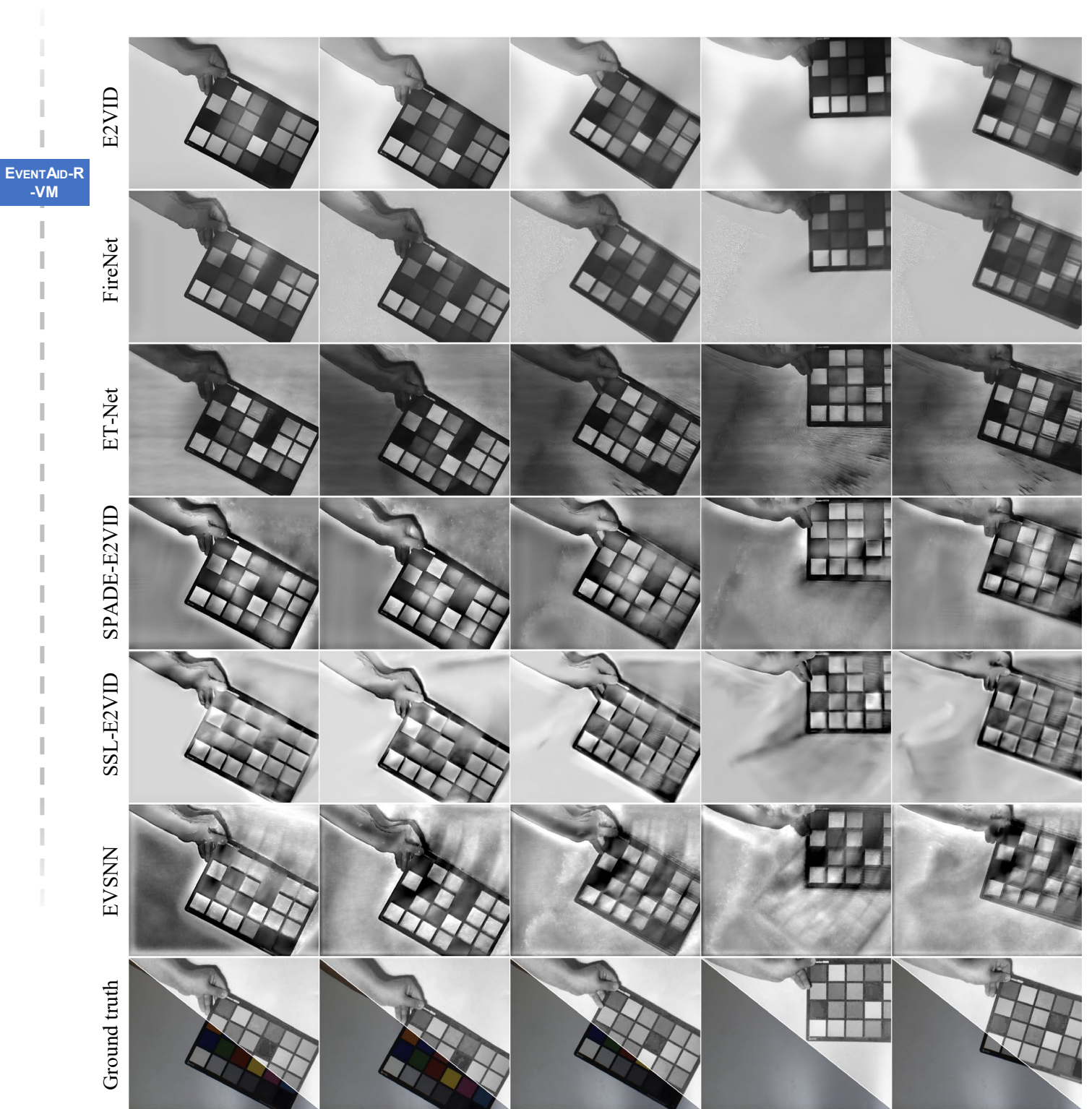


Figure S1-34: Comparison results of simulated EVENTAID-R-VM dataset (#6 R-ROOM2)

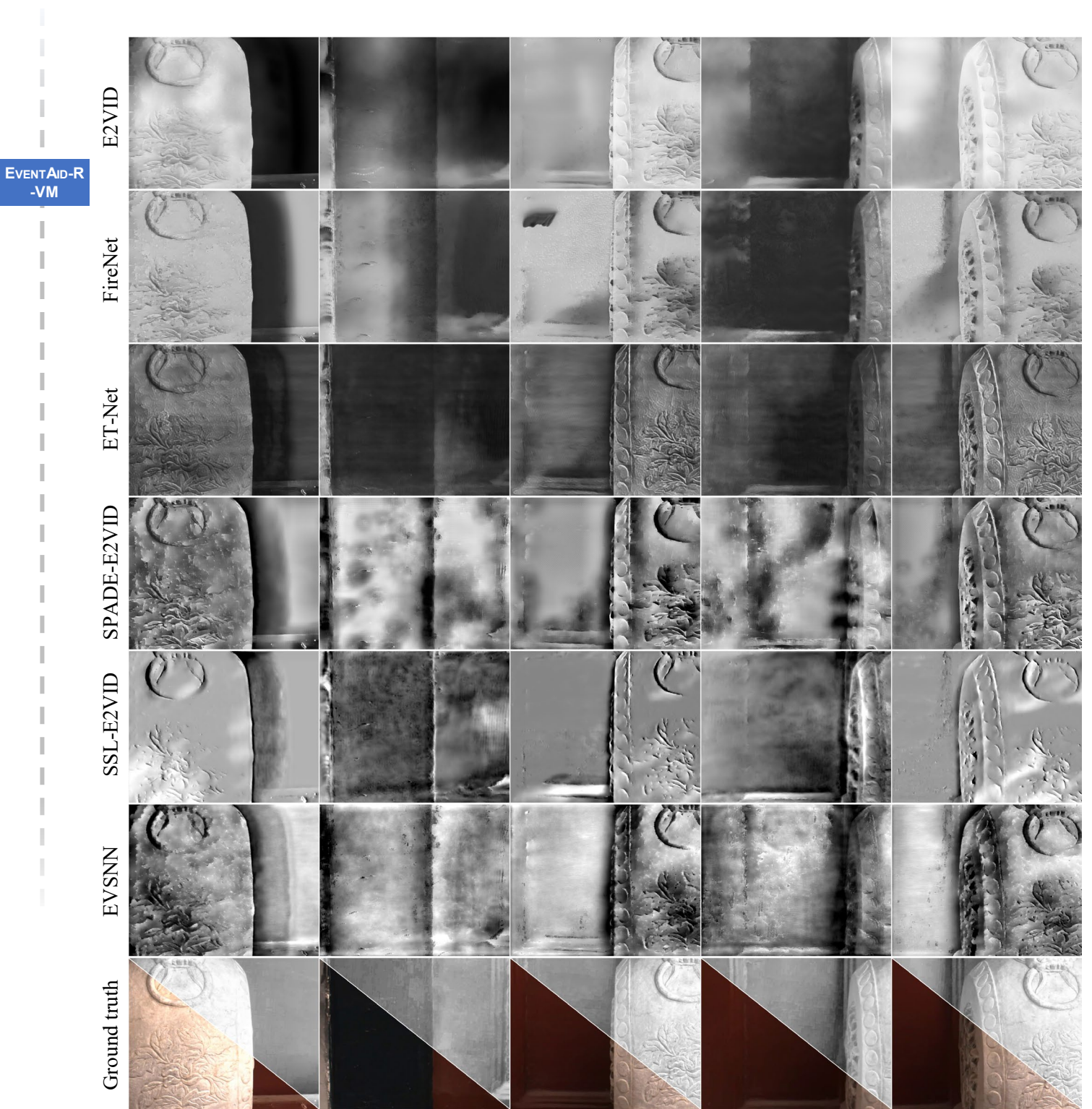


Figure S1-35: Comparison results of simulated EVENTAID-R-VM dataset (#7 R-SCULPTURE)

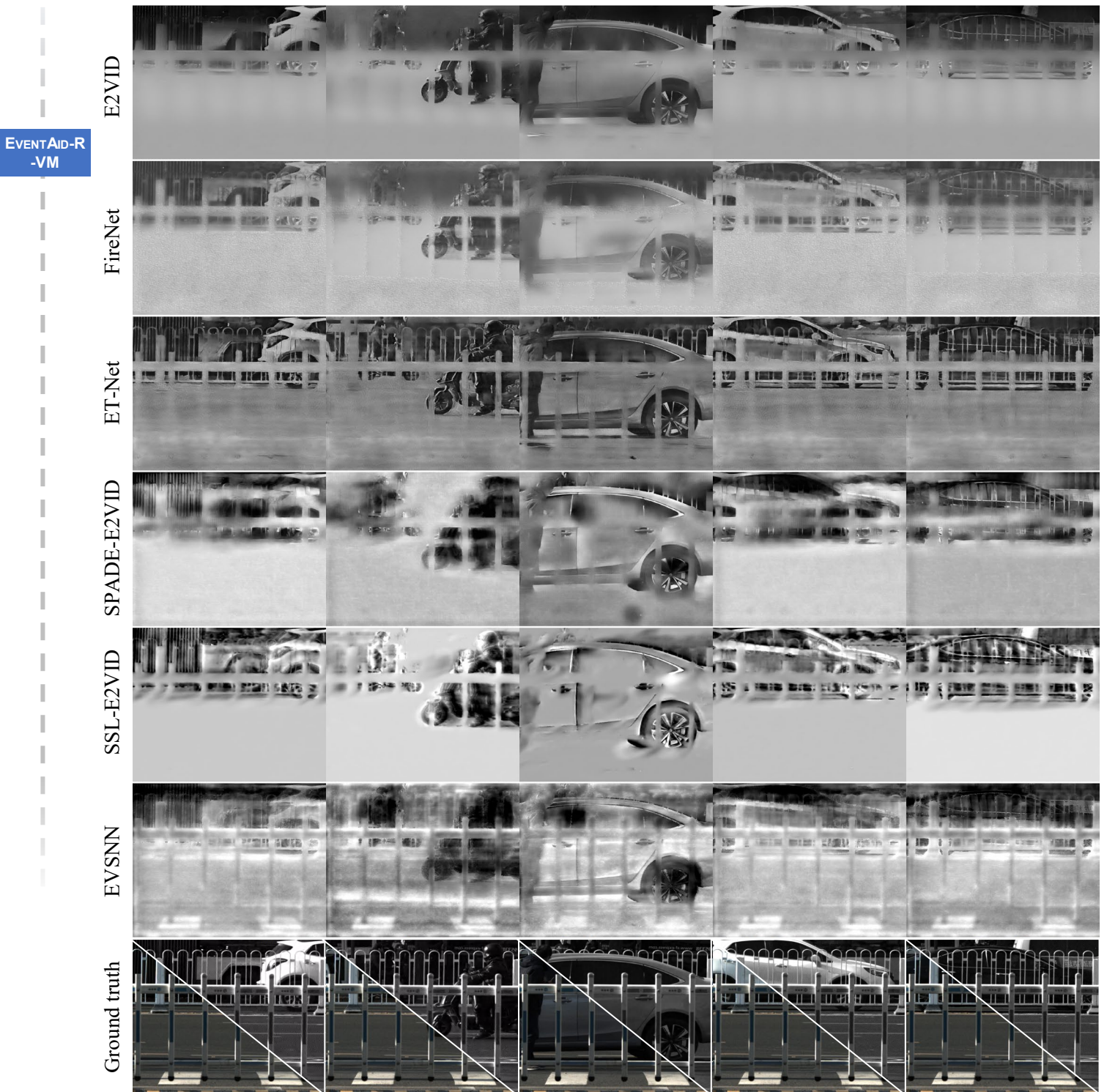


Figure S1-36: Comparison results of simulated EVENTAID-R-VM dataset (#8 R-TRAFFIC)

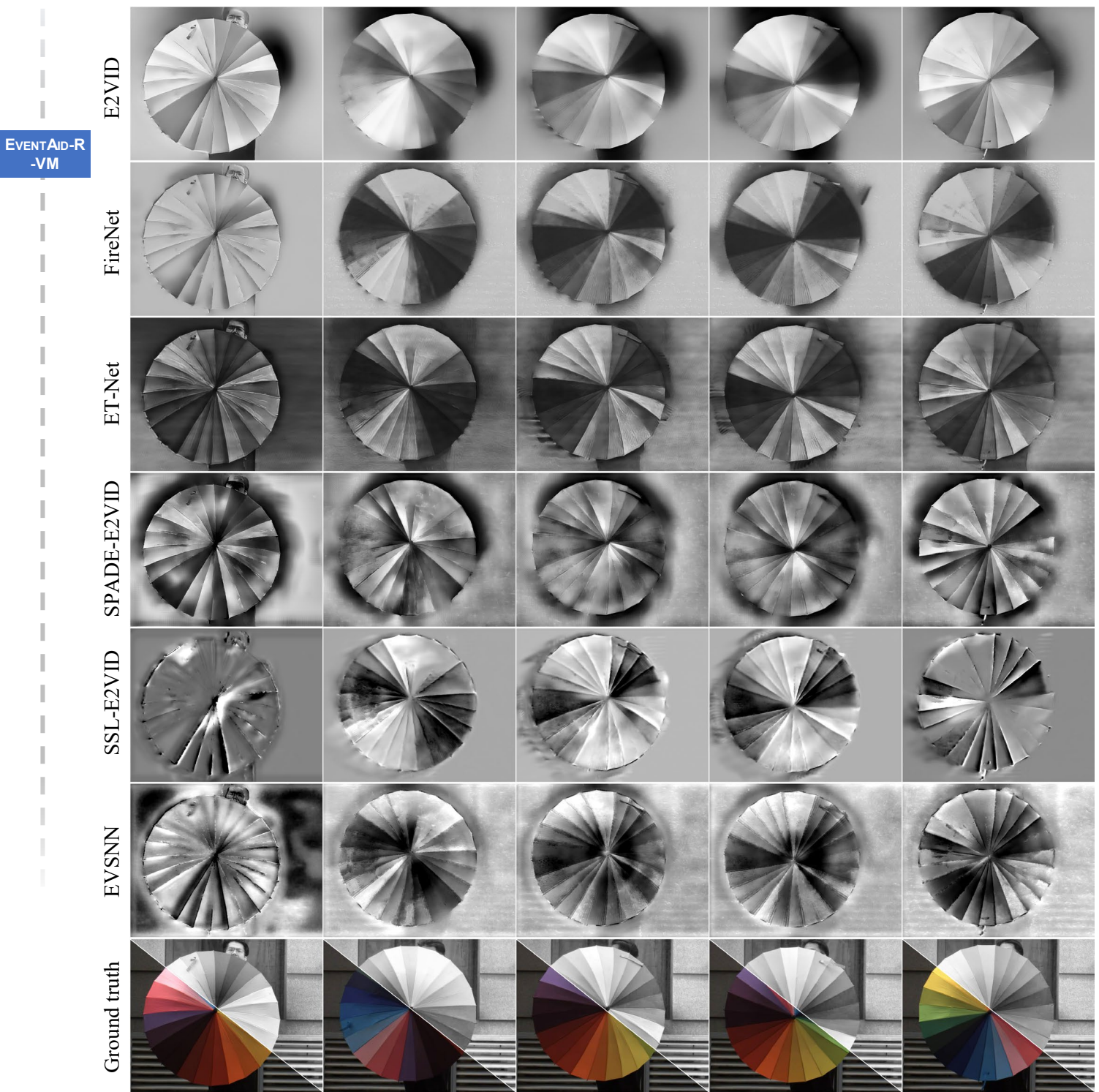


Figure S1-37: Comparison results of simulated EVENTAID-R-VM dataset (#9 R-UMBRELLA)

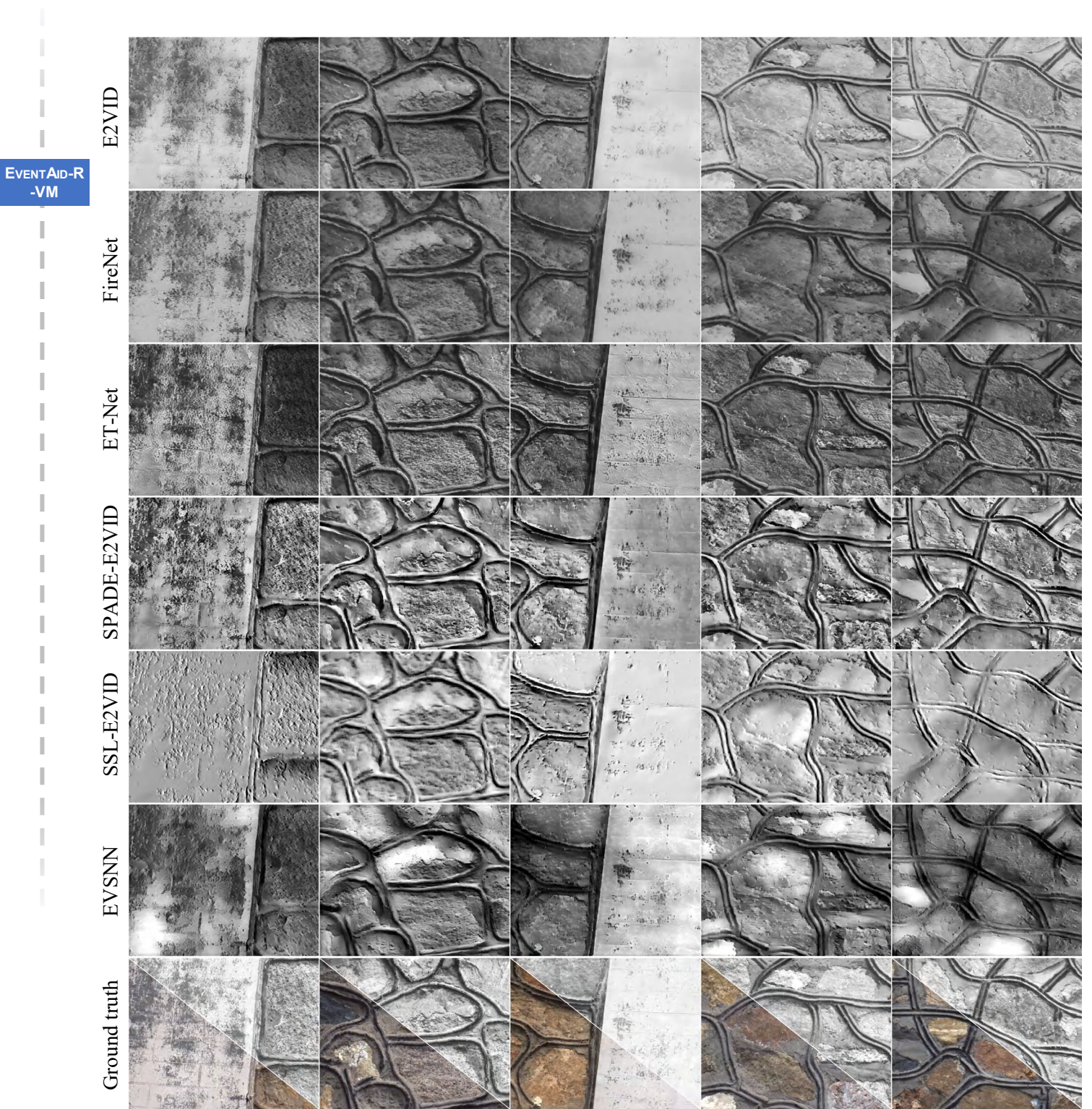


Figure S1-38: Comparison results of simulated EVENTAID-R-VM dataset (#10 R-WALL)

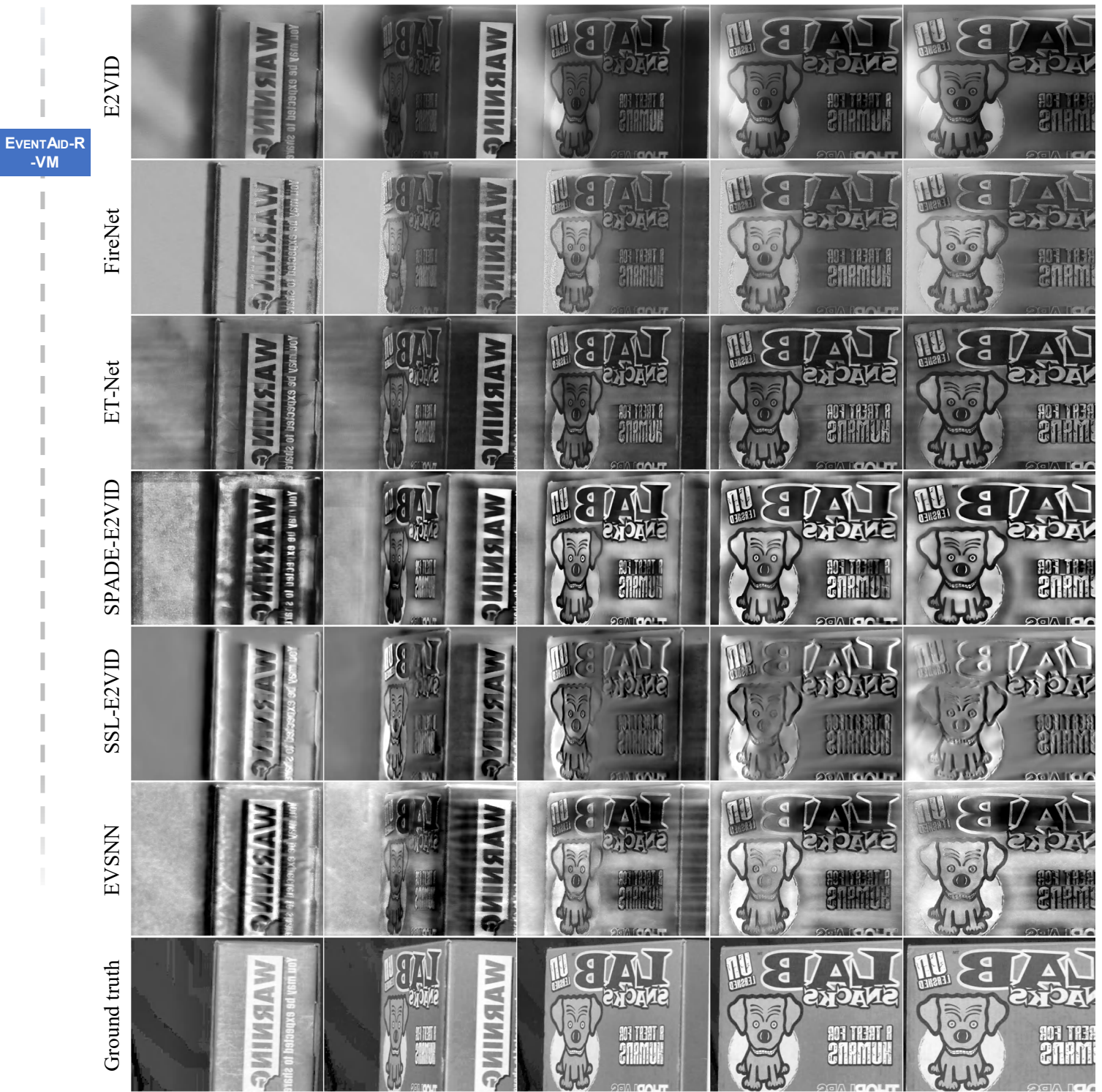


Figure S1-39: Comparison results of simulated EVENTAID-R-VM dataset (#11 R-BOX)

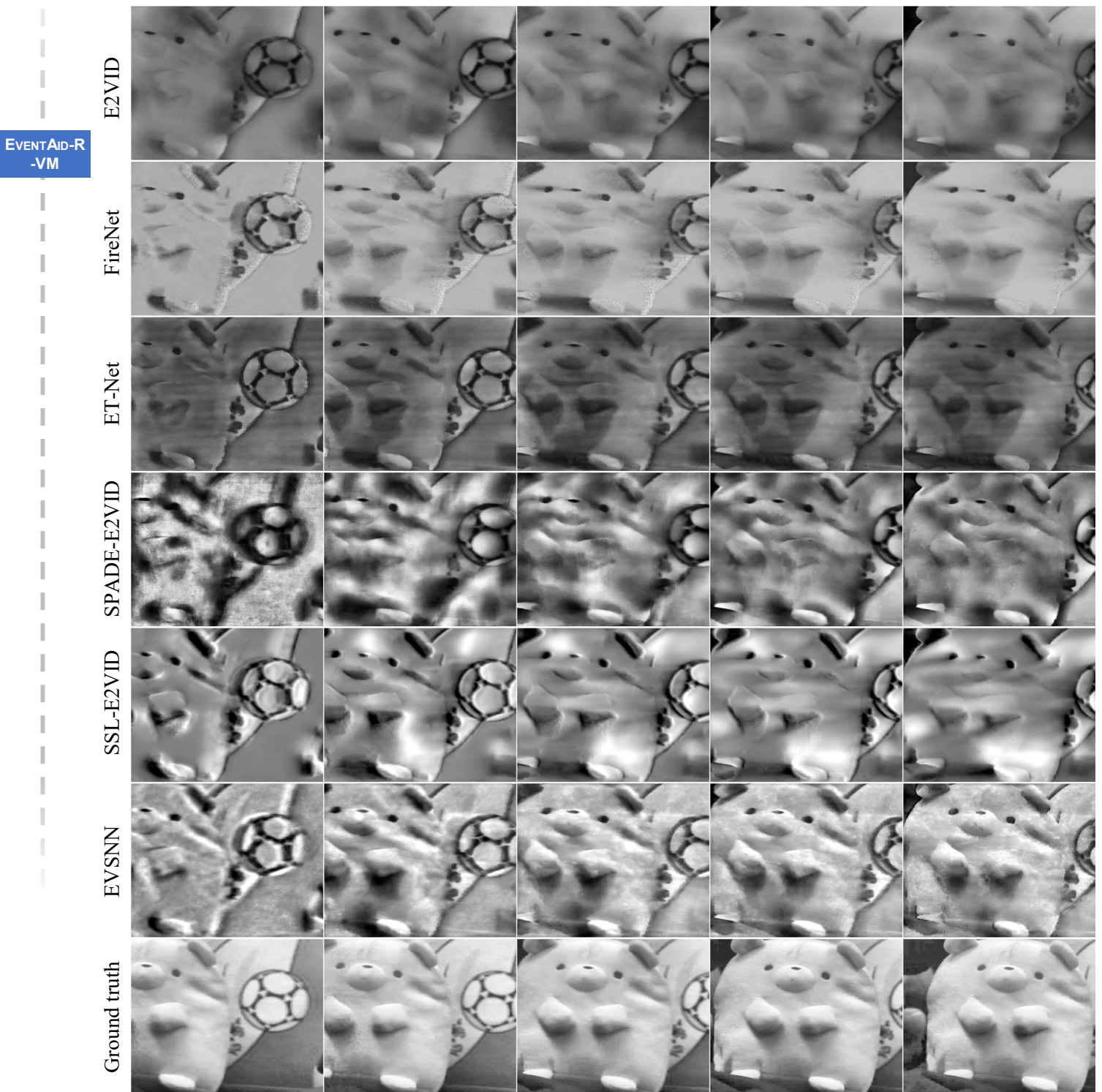


Figure S1-40: Comparison results of simulated EVENTAID-R-VM dataset (#12 R-BEAR)

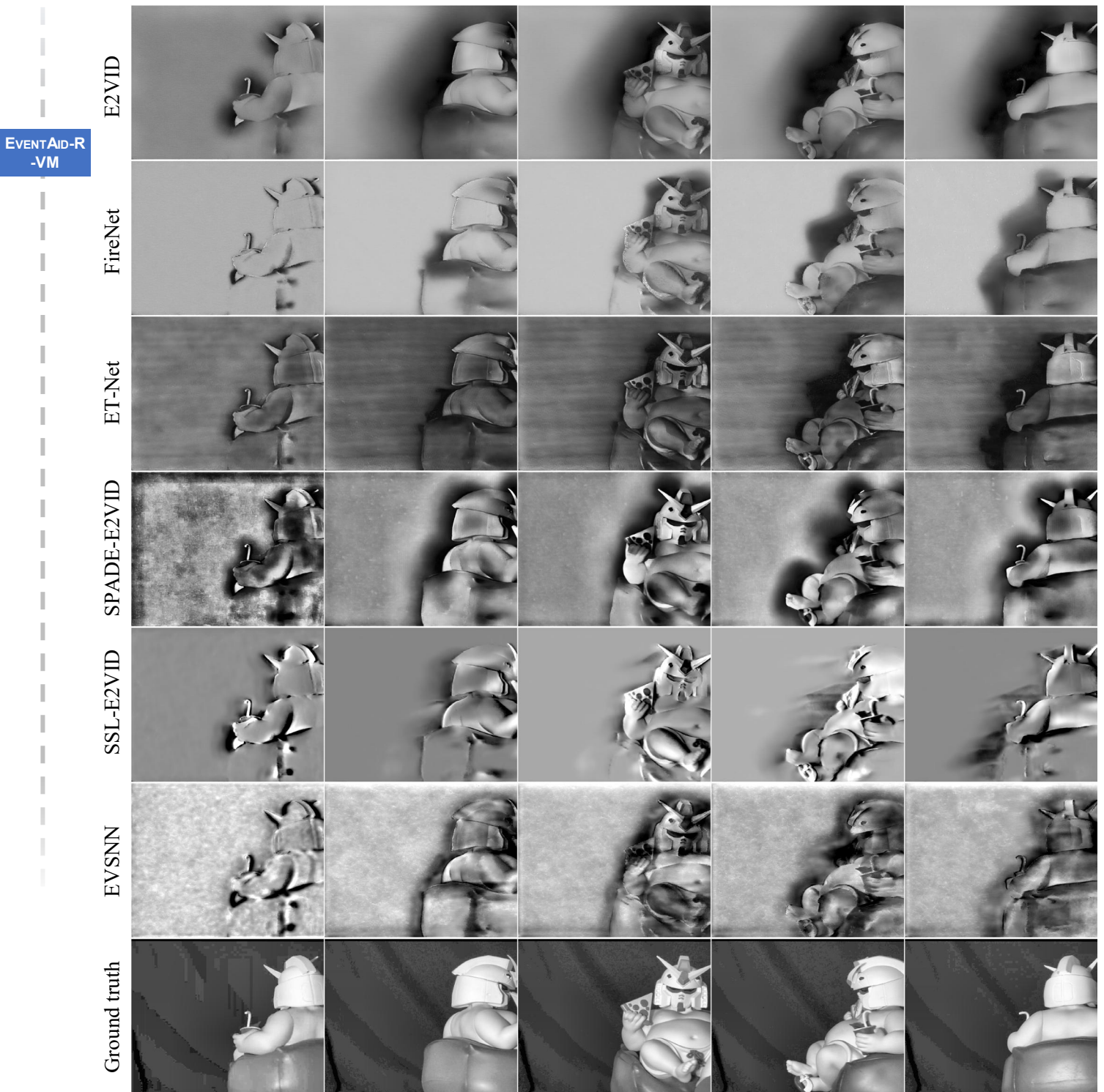


Figure S1-41: Comparison results of simulated EVENTAID-R-VM dataset (#13 R-TOY)

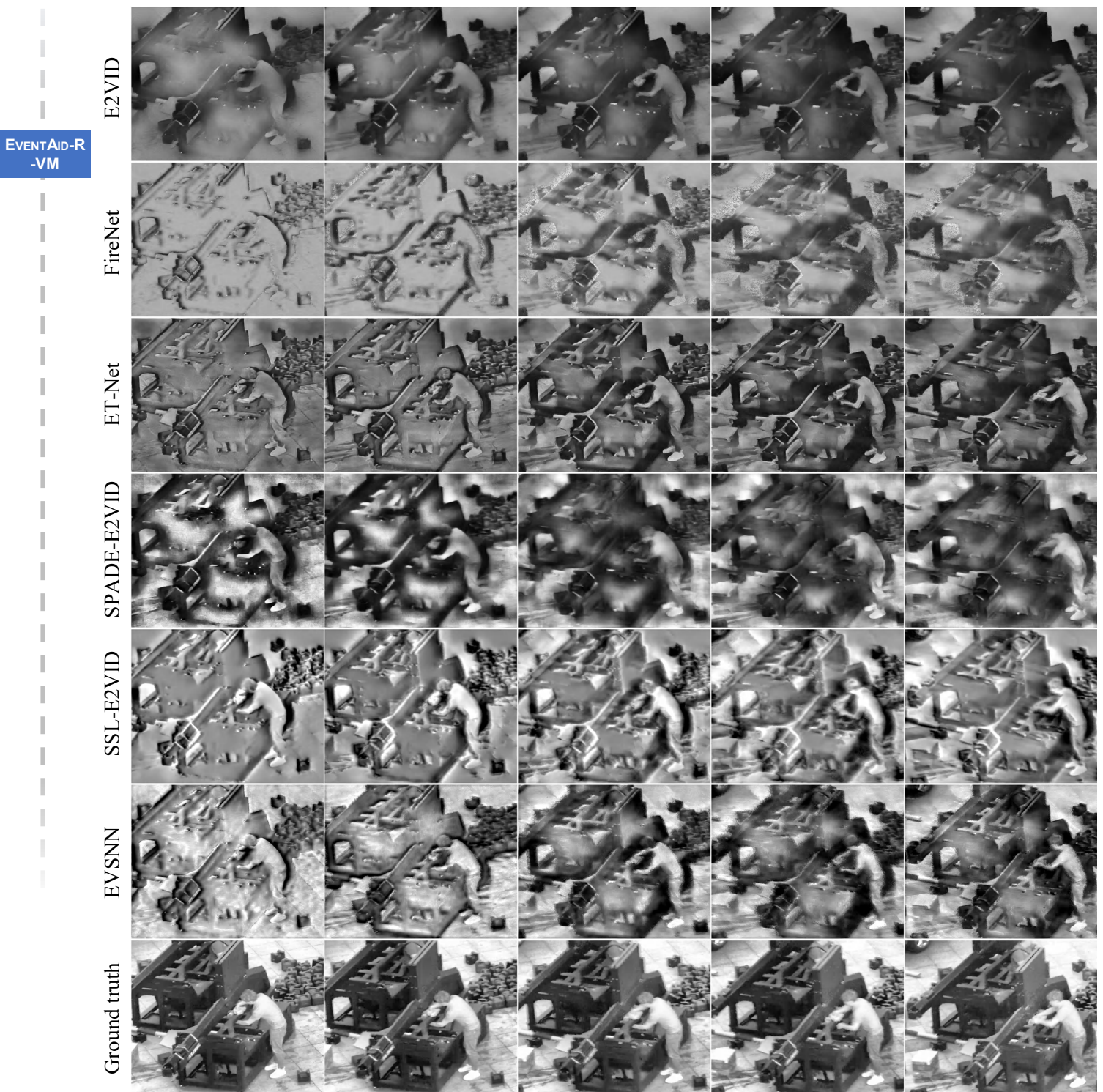


Figure S1-42: Comparison results of simulated EVENTAID-R-VM dataset (#14 R-OUTDOOR)

2 QUALITATIVE COMPARISON RESULTS: EVENT-AIDED HFR VIDEO RECONSTRUCTION

2.1 Results on real-captured EVENTAID-F dataset

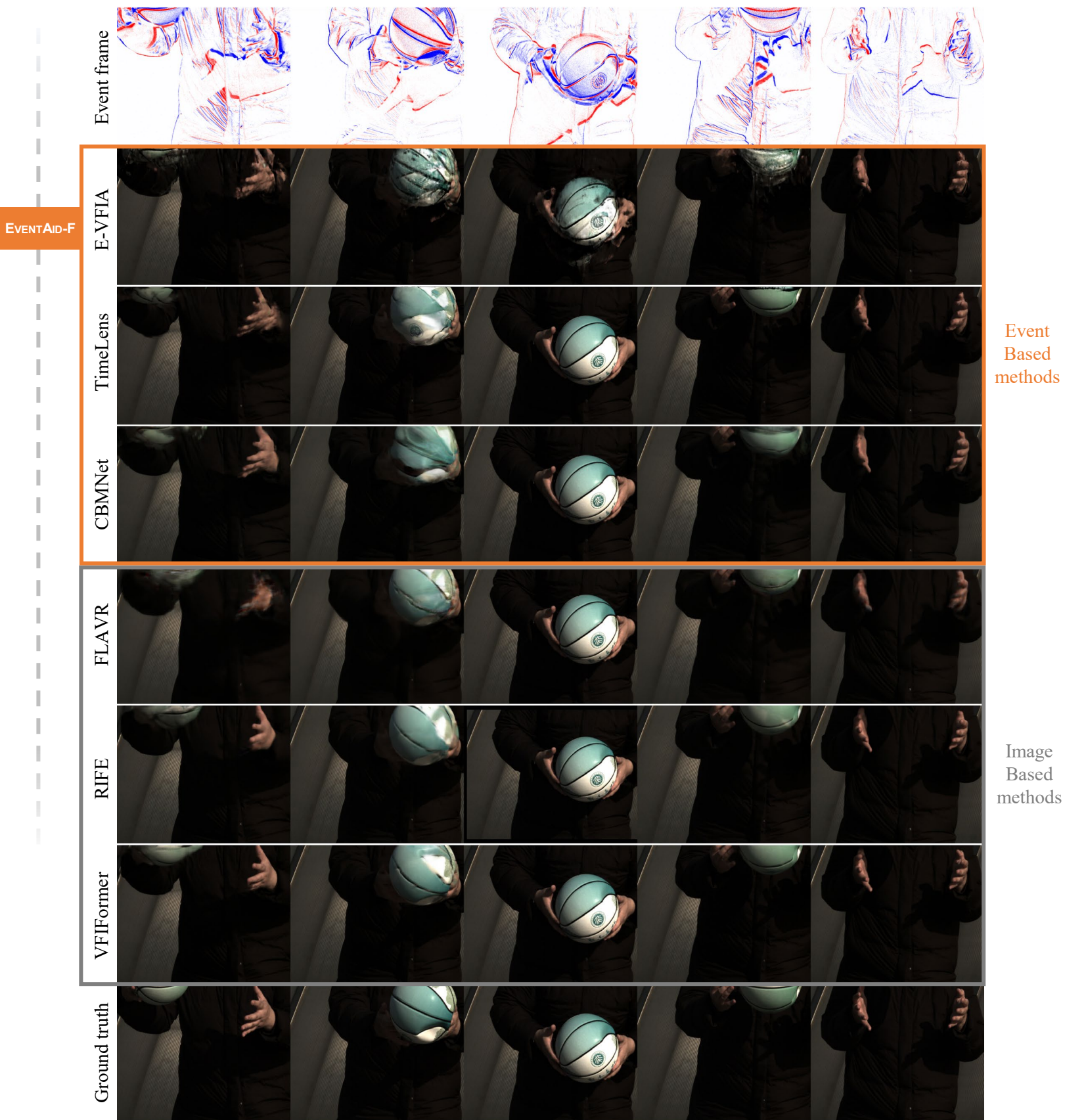
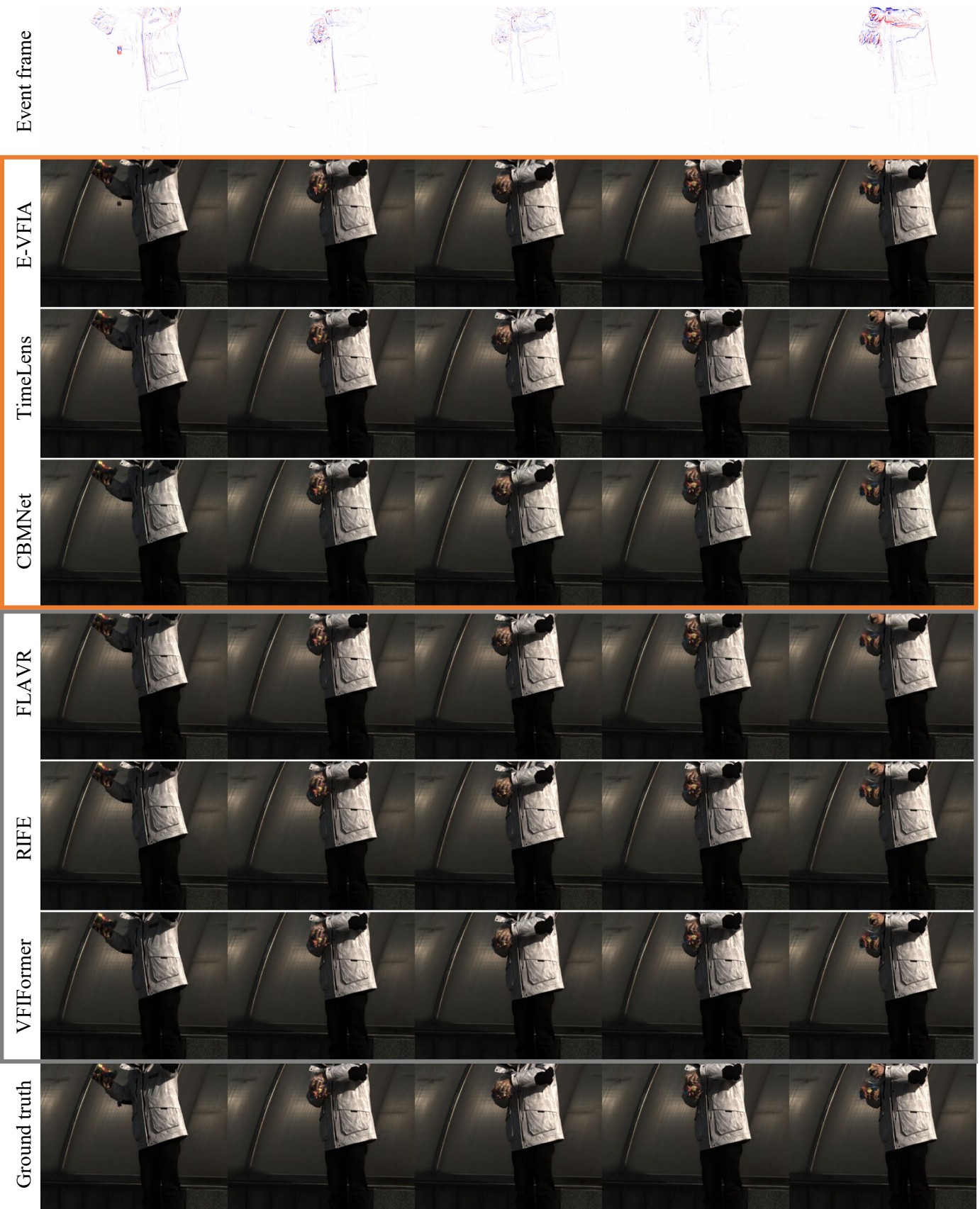


Figure S2-1: Comparison results of real-captured EVENTAID-F dataset (#1 F-BALL)
(Compared with pretrained model)

EVENTAID-F

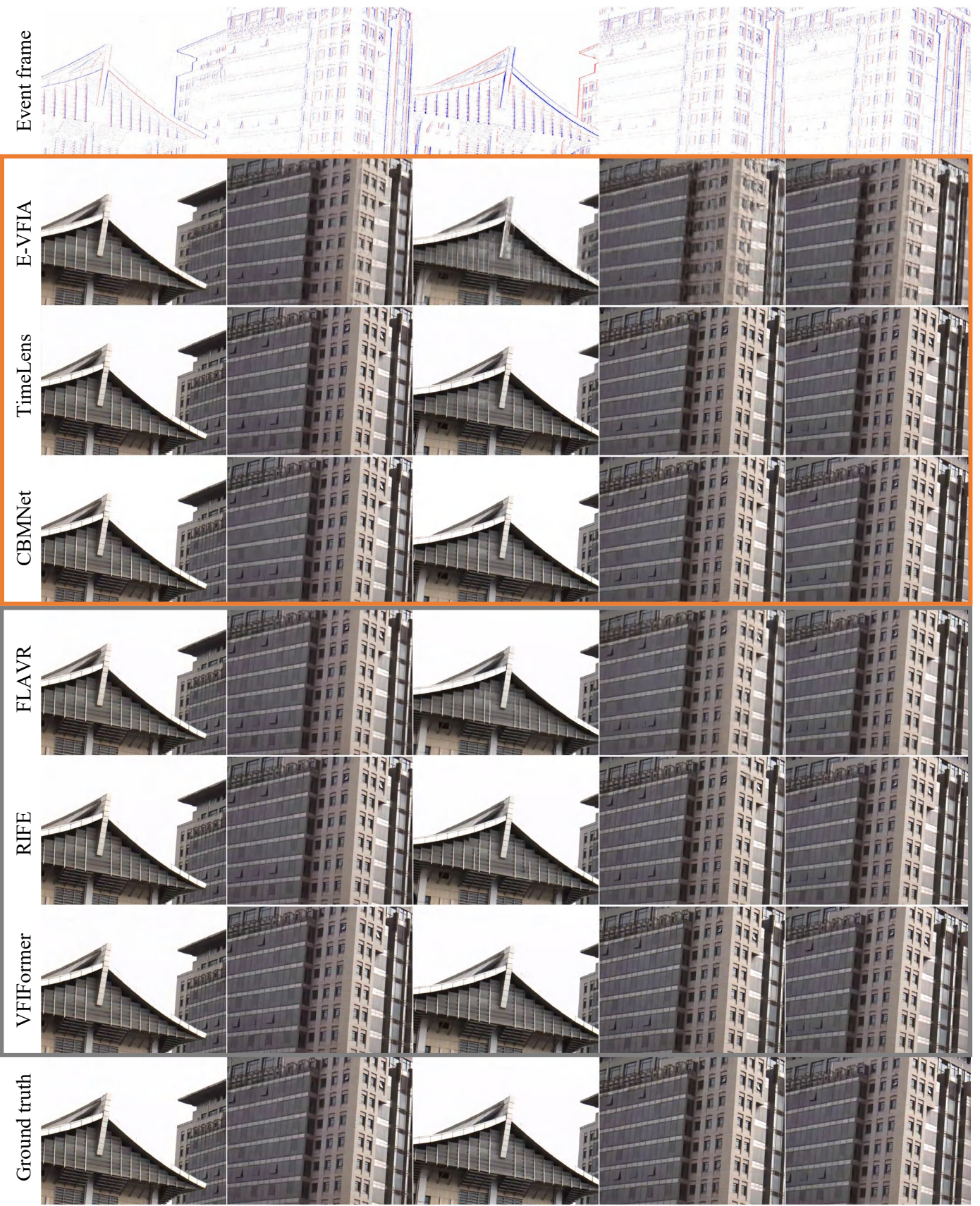


Event Based methods

Image Based methods

Figure S2-2: Comparison results of real-captured EVENTAID-F dataset (#2 F-BLOCKS) (Compared with pretrained model)

EVENTAID-F



Event Based methods

Image Based methods

Figure S2-3: Comparison results of real-captured EVENTAID-F dataset (#3 F-BUILDING) (Compared with pretrained model)

EVENTAID-F

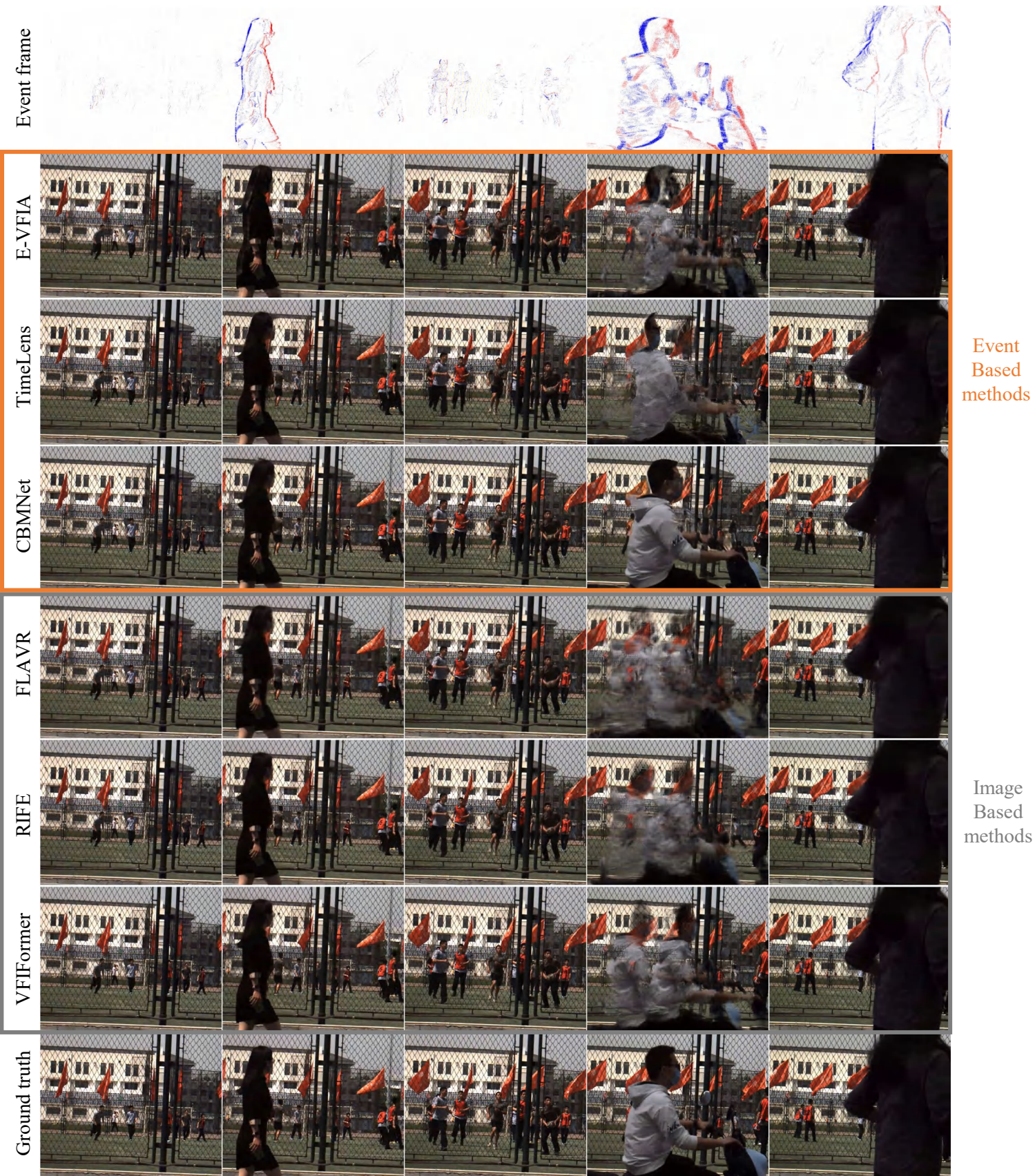


Figure S2-4: Comparison results of real-captured EVENTAID-F dataset (#4 F-PLAYBALL) (Compared with pretrained model)

EVENTAID-F

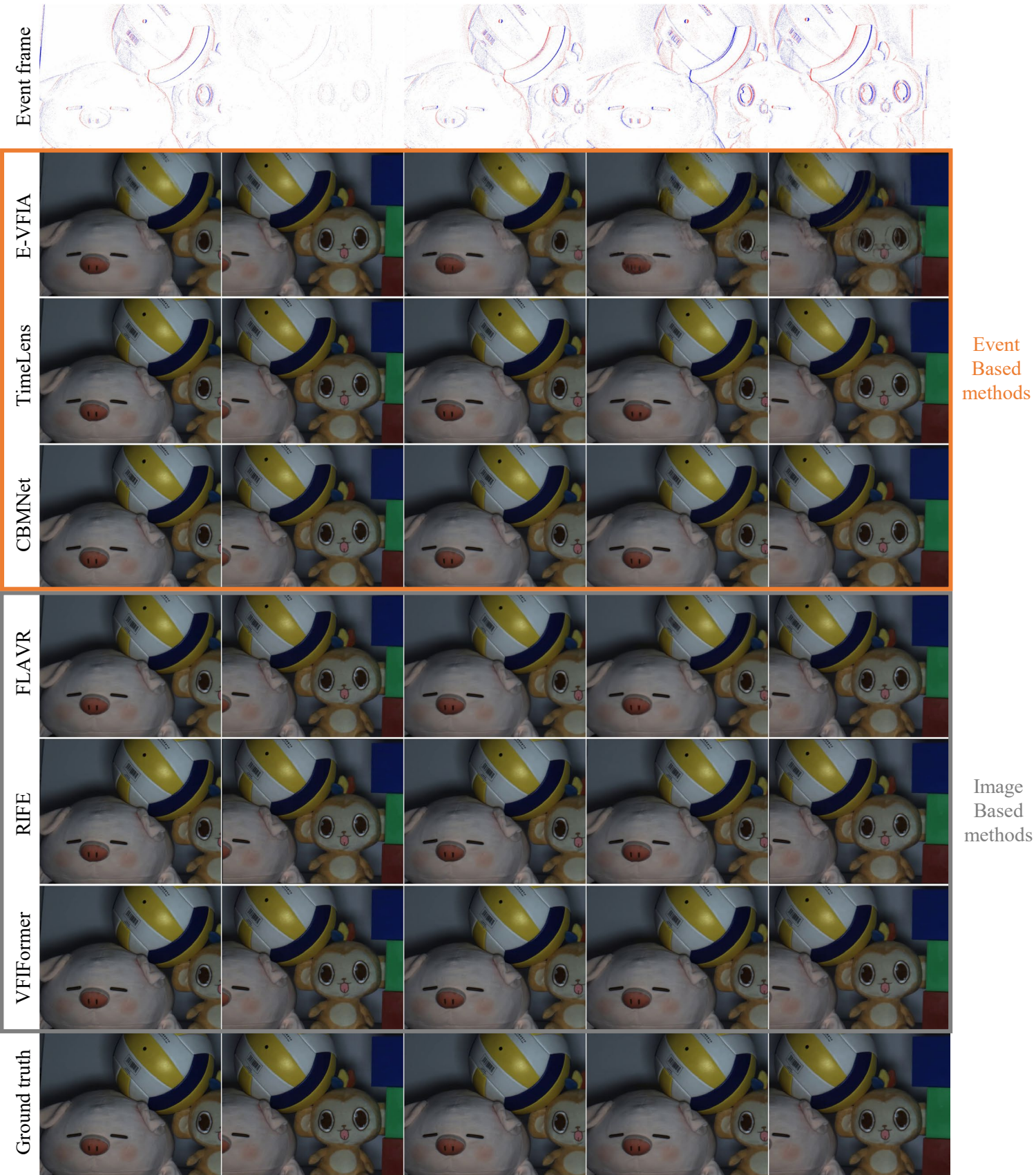


Figure S2-5: Comparison results of real-captured EVENTAID-F dataset (#5 F-ROOM1) (Compared with pretrained model)

EVENTAID-F

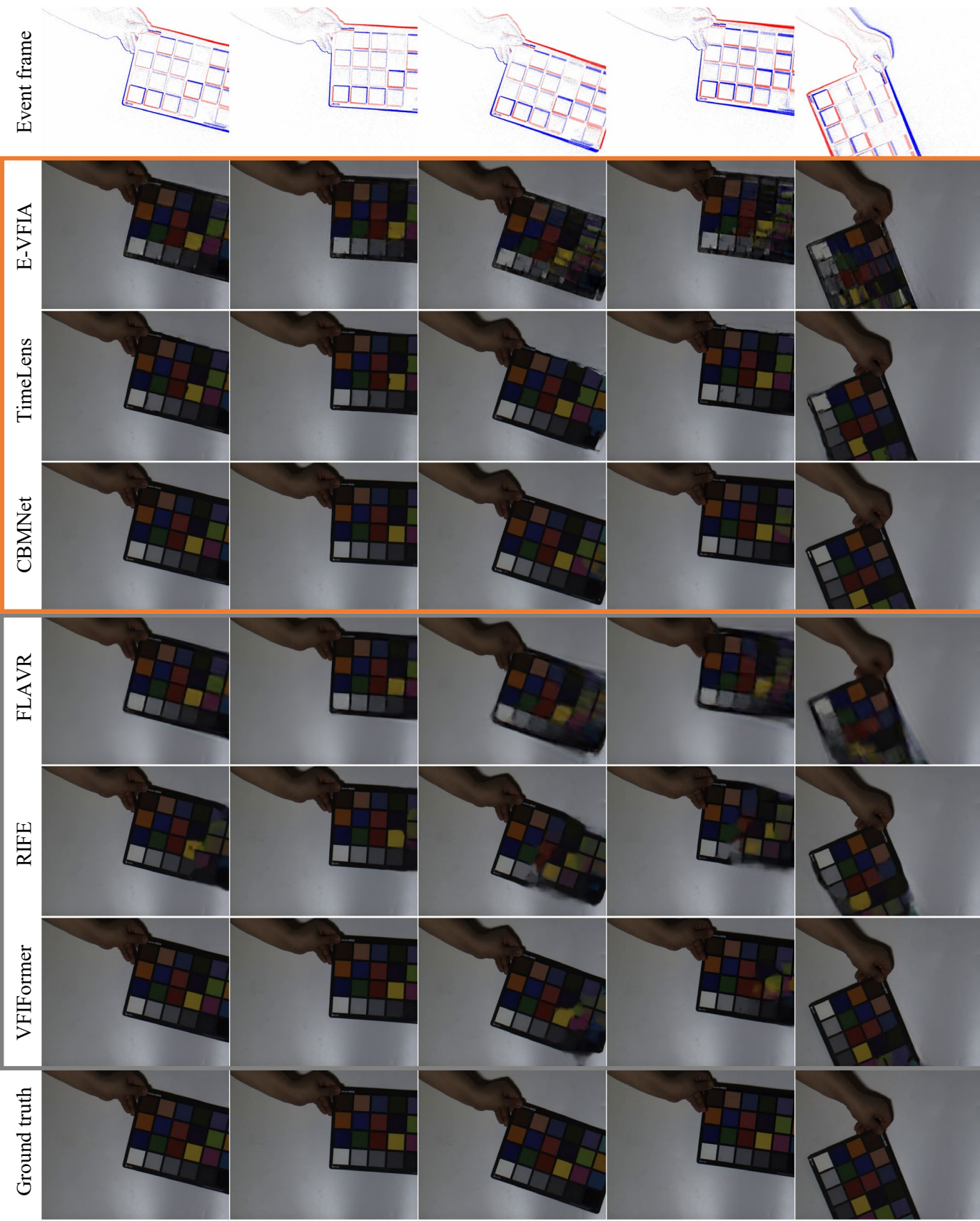


Figure S2-6: Comparison results of real-captured EVENTAID-F dataset (#6 F-ROOM2) (Compared with pretrained model)

EVENTAID-F

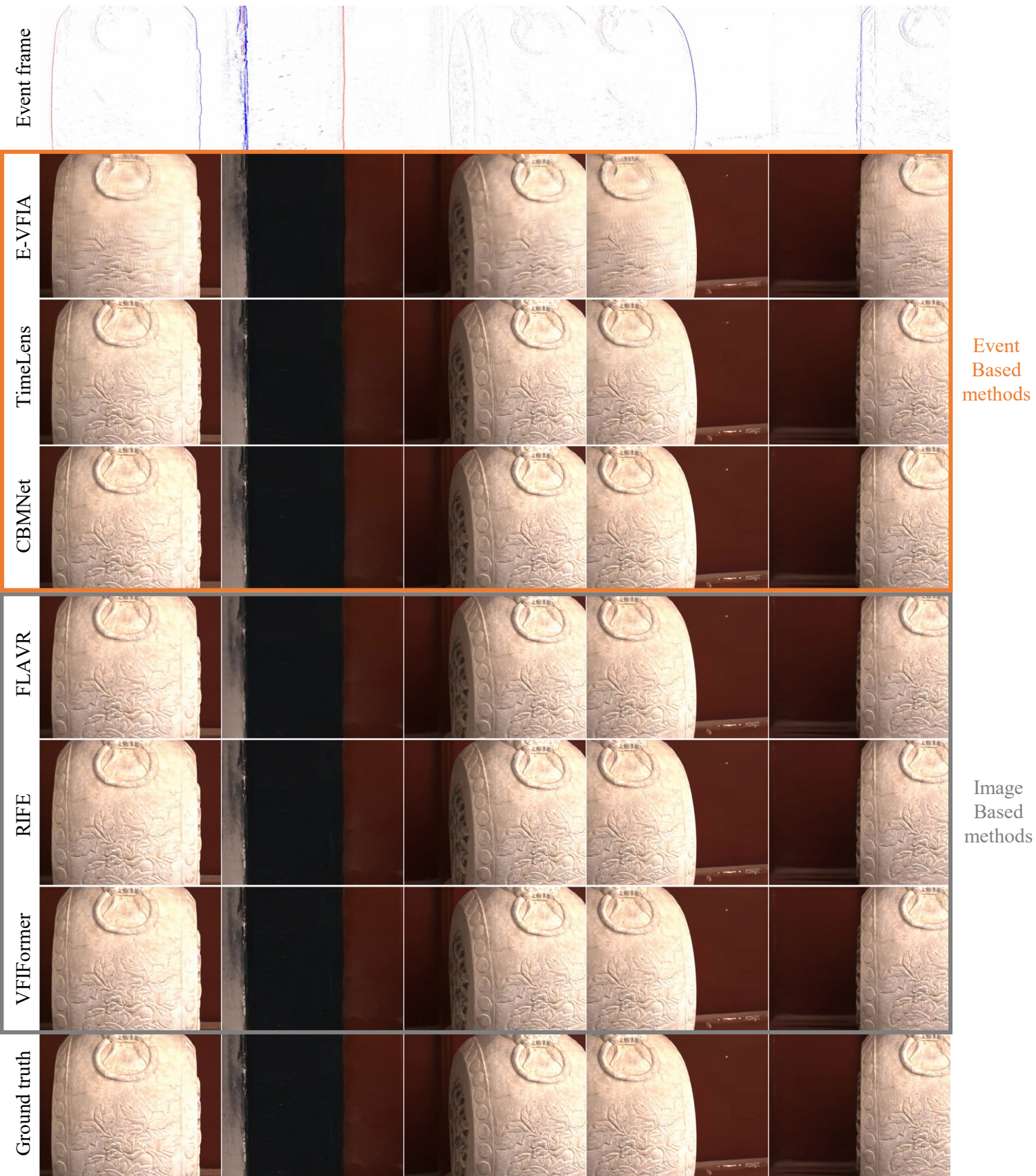
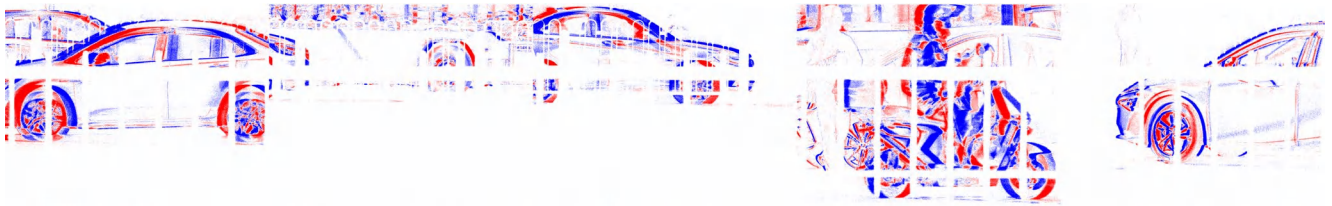


Figure S2-7: Comparison results of real-captured EVENTAID-F dataset (#7 F-SCULPTURE) (Compared with pretrained model)

EVENTAID-F

Event frame



E-VFIA



TimeLens



CBMNet



FLAVR



RIFE



VFIFormer



Ground truth



Event Based methods

Image Based methods

Figure S2-8: Comparison results of real-captured EVENTAID-F dataset (#8 F-TRAFFIC) (Compared with pretrained model)

EVENTAID-F

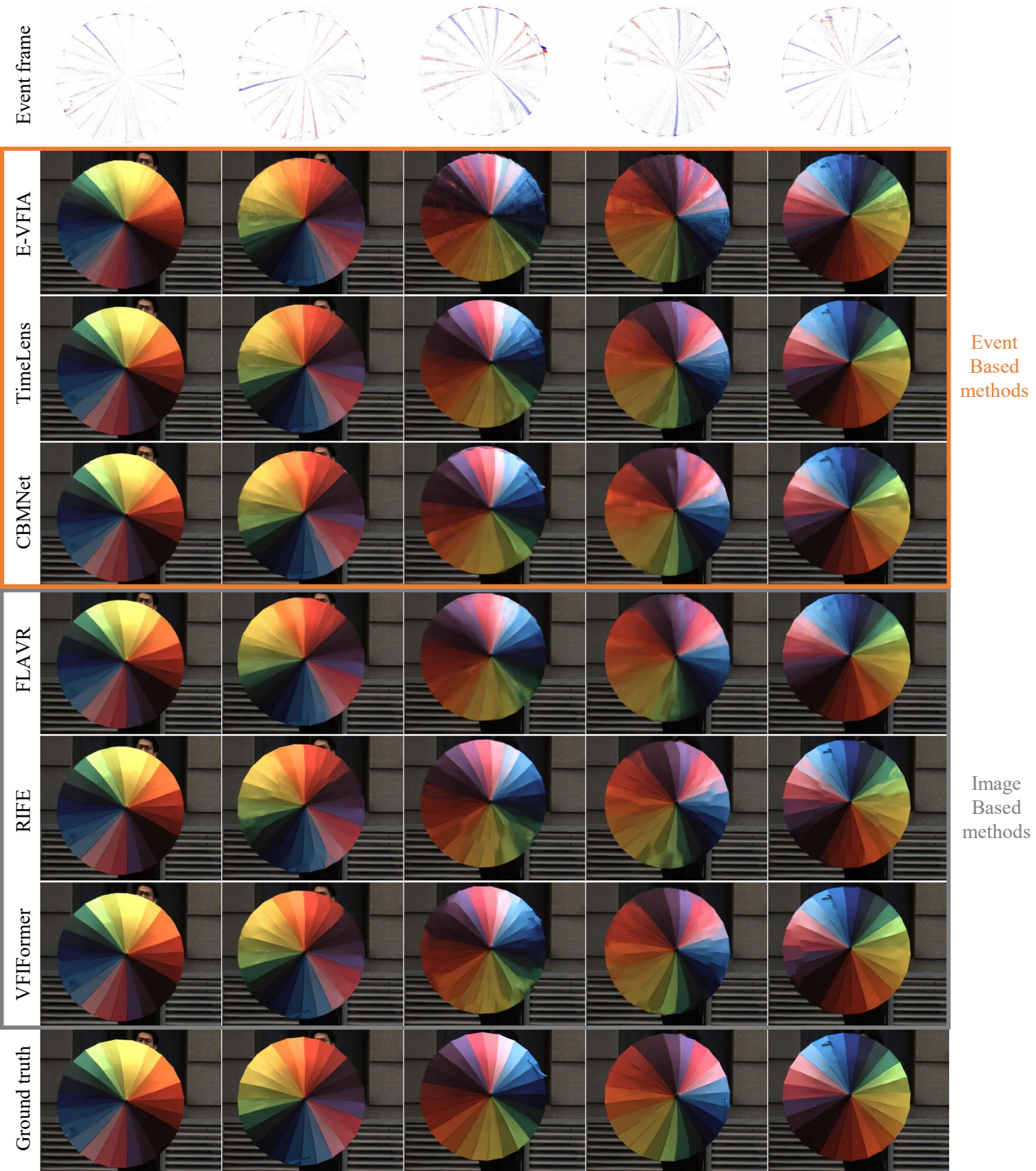


Figure S2-9: Comparison results of real-captured EVENTAID-F dataset (#9 F-UMBRELLA)
(Compared with pretrained model)

EVENTAID-F

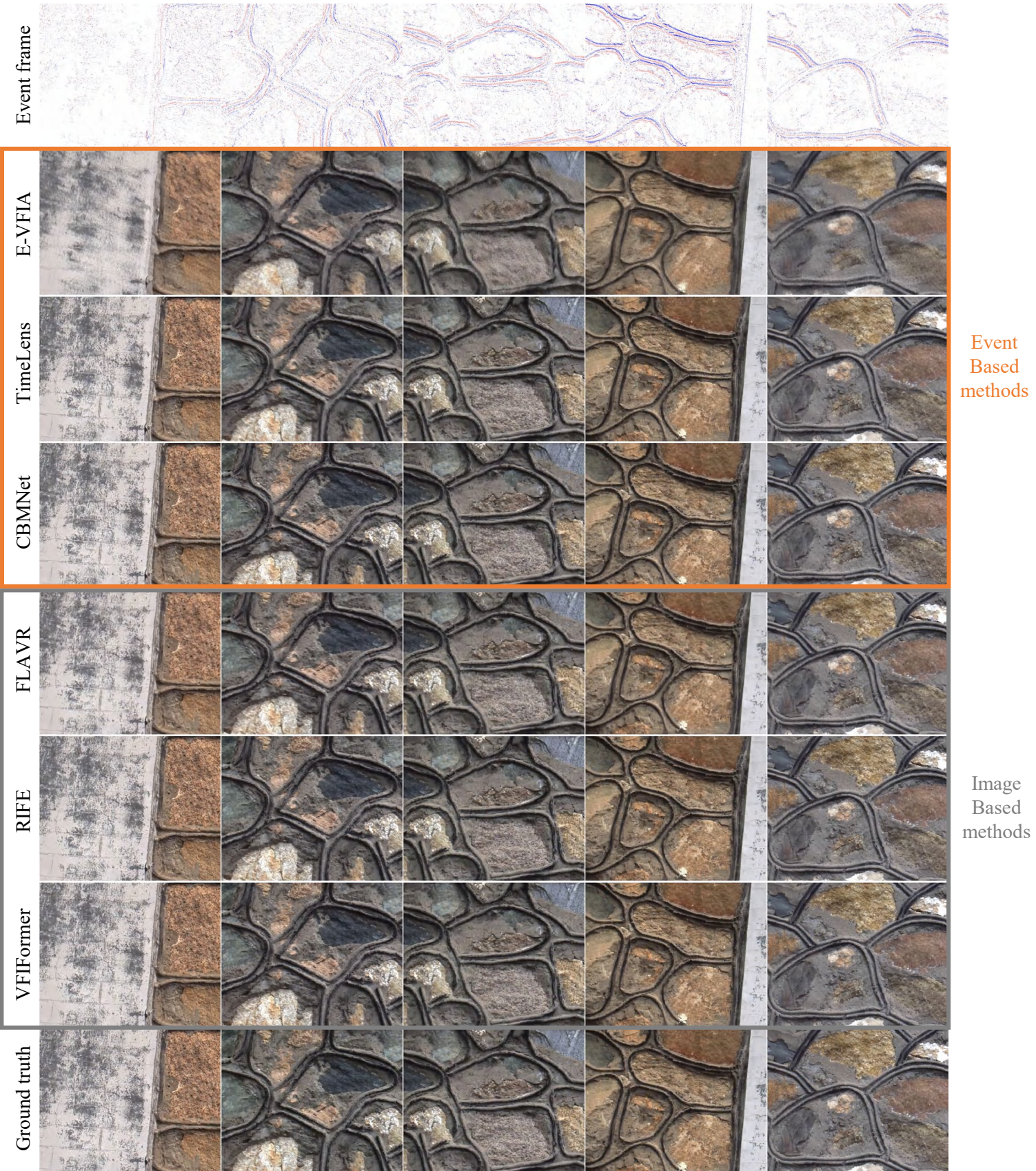
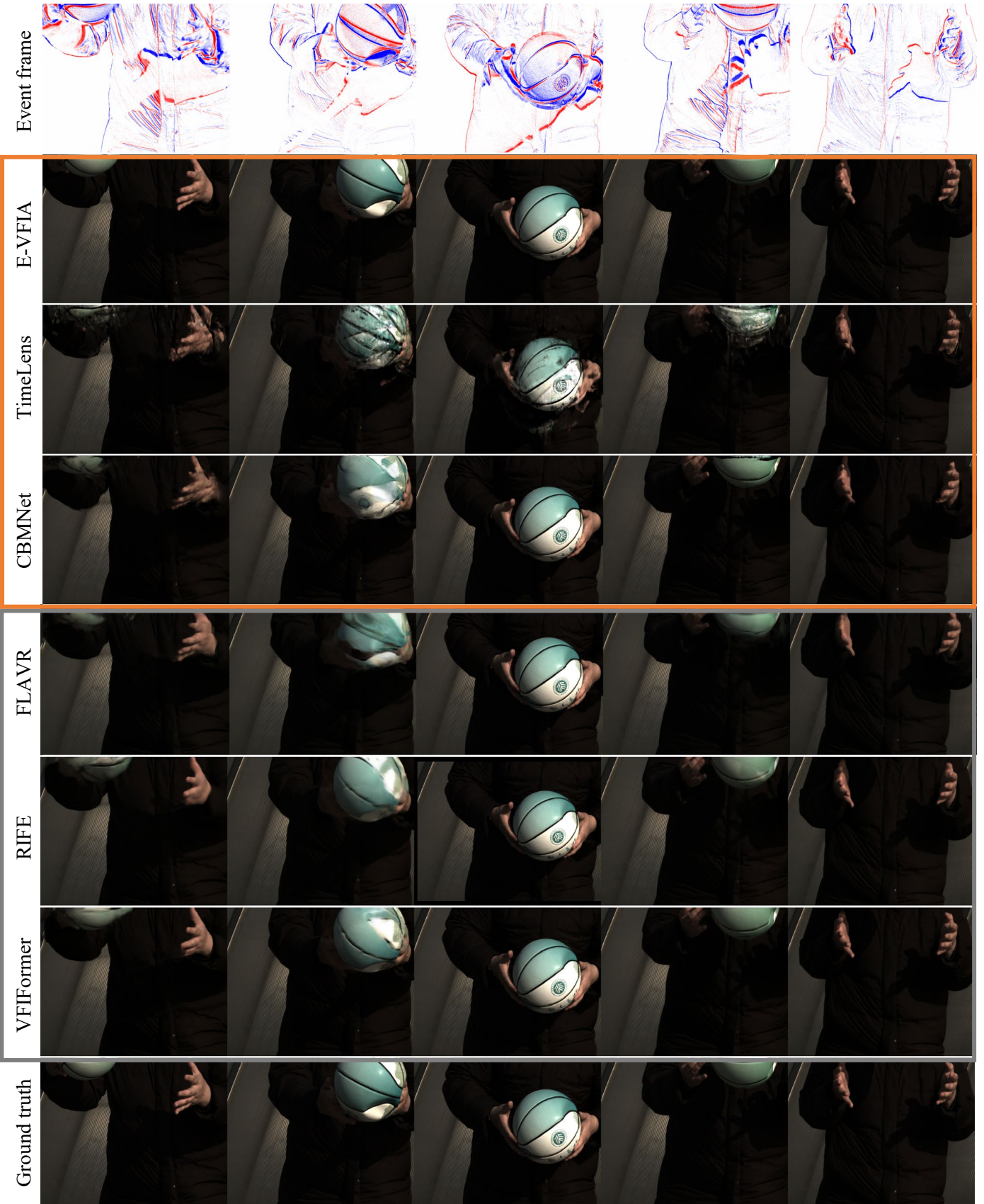


Figure S2-10: Comparison results of real-captured EVENTAID-F dataset (#10 F-WALL)
 (Compared with pretrained model)

EVENTAID-F



Event Based methods

Image Based methods

Figure S2-11: Comparison results of real-captured EVENTAID-F dataset (#1 F-BALL) (Compared with finetuned model)

EVENTAID-F

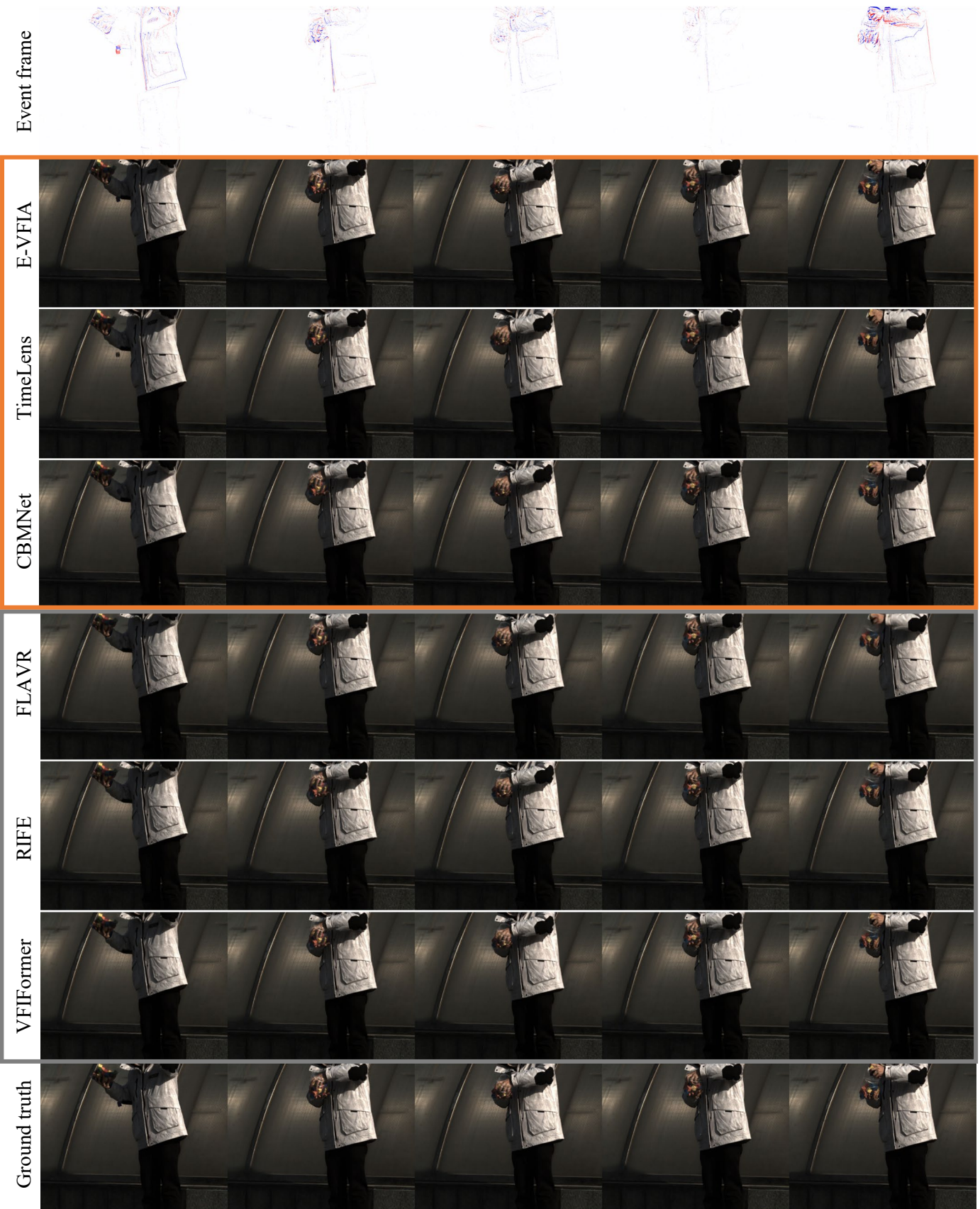


Figure S2-12: Comparison results of real-captured EVENTAID-F dataset (#2 F-BLOCKS)
 (Compared with finetuned model)

EVENTAID-F

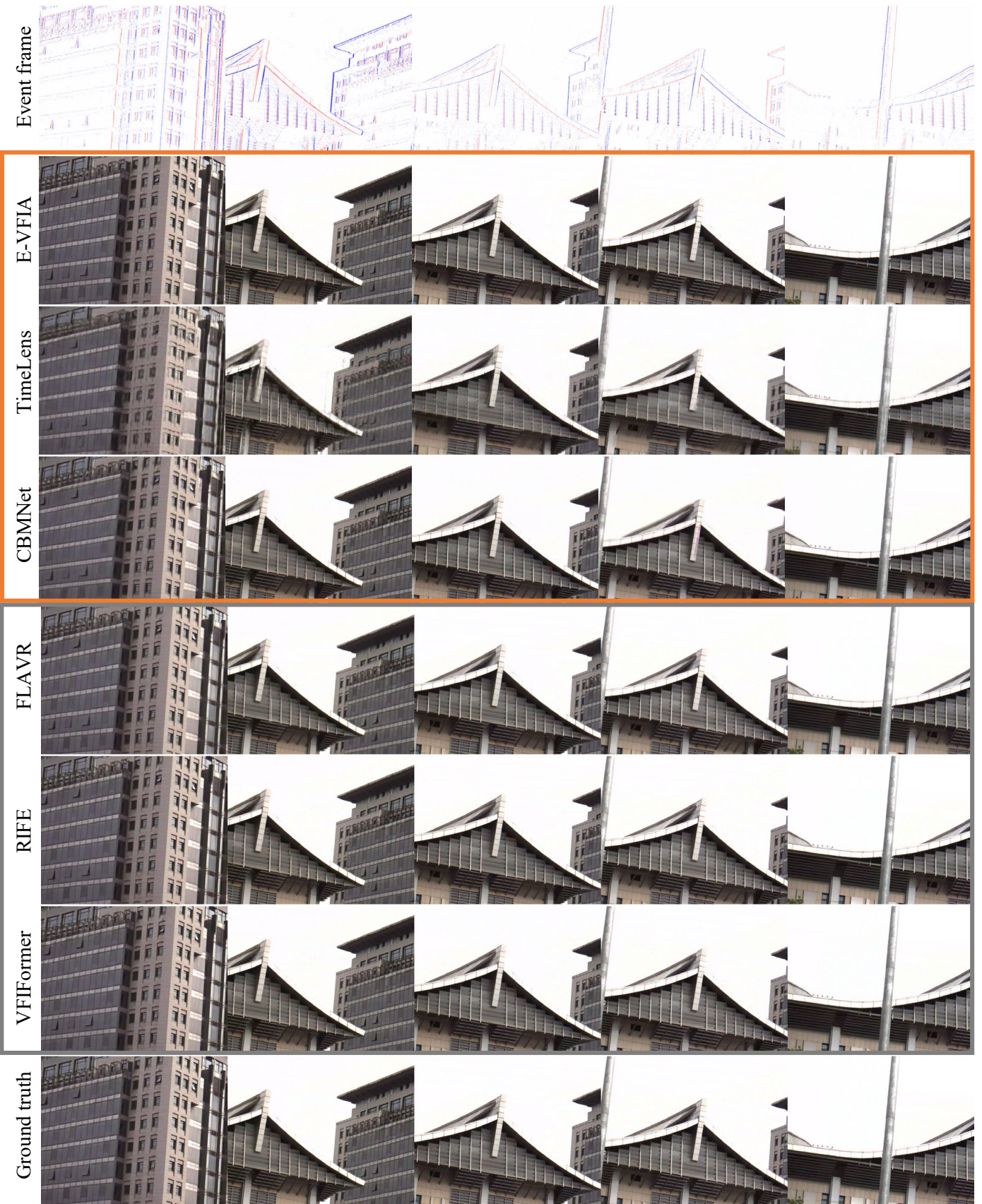


Figure S2-13: Comparison results of real-captured EVENTAID-F dataset (#3 F-BUILDING) (Compared with finetuned model)

EVENTAID-F



Event Based methods

Image Based methods

Figure S2-14: Comparison results of real-captured EVENTAID-F dataset (#4 F-PLAYBALL) (Compared with finetuned model)

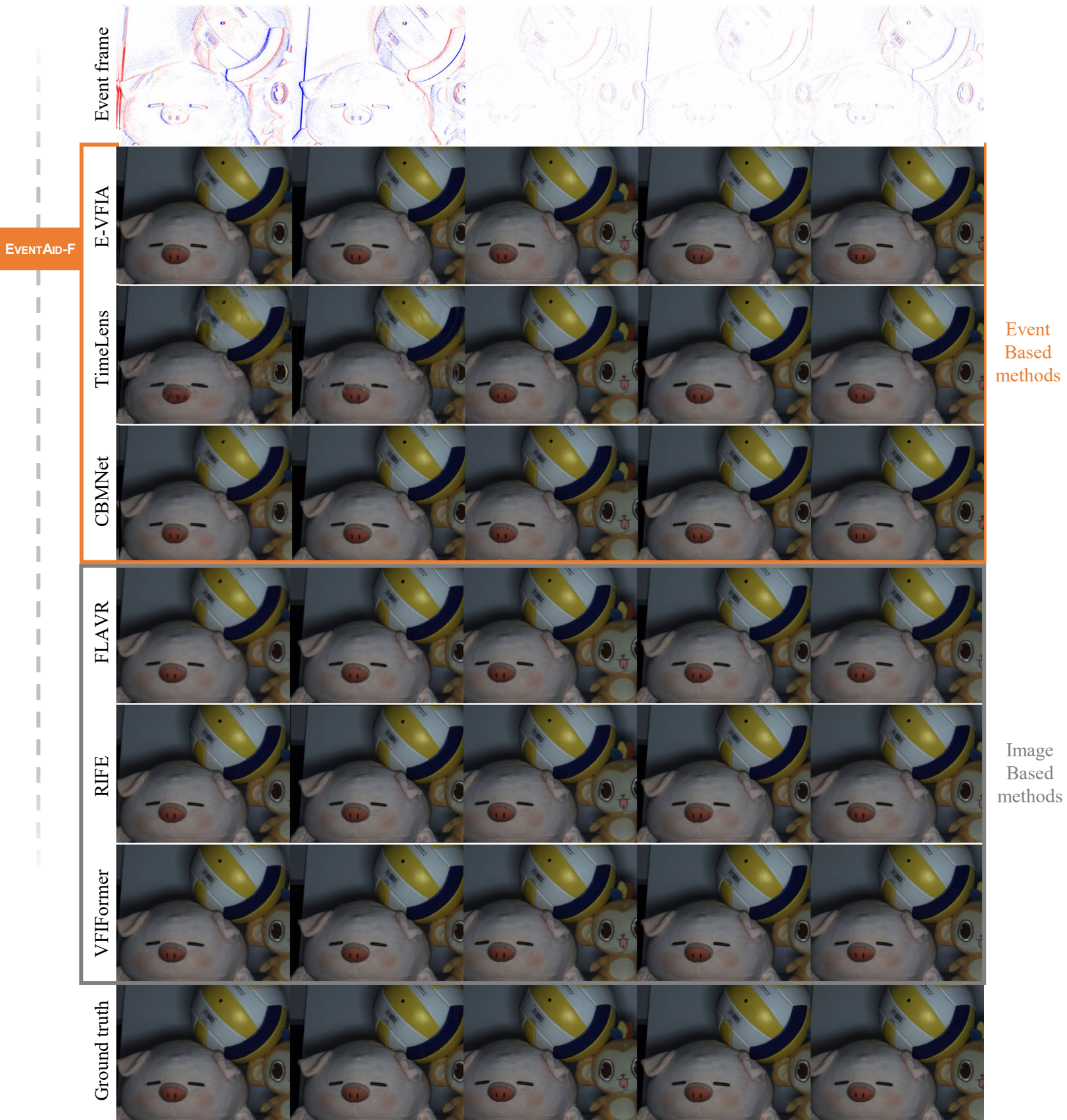


Figure S2-15: Comparison results of real-captured EVENTAID-F dataset (#5 F-ROOM1)
 (Compared with finetuned model)

EVENTAID-F

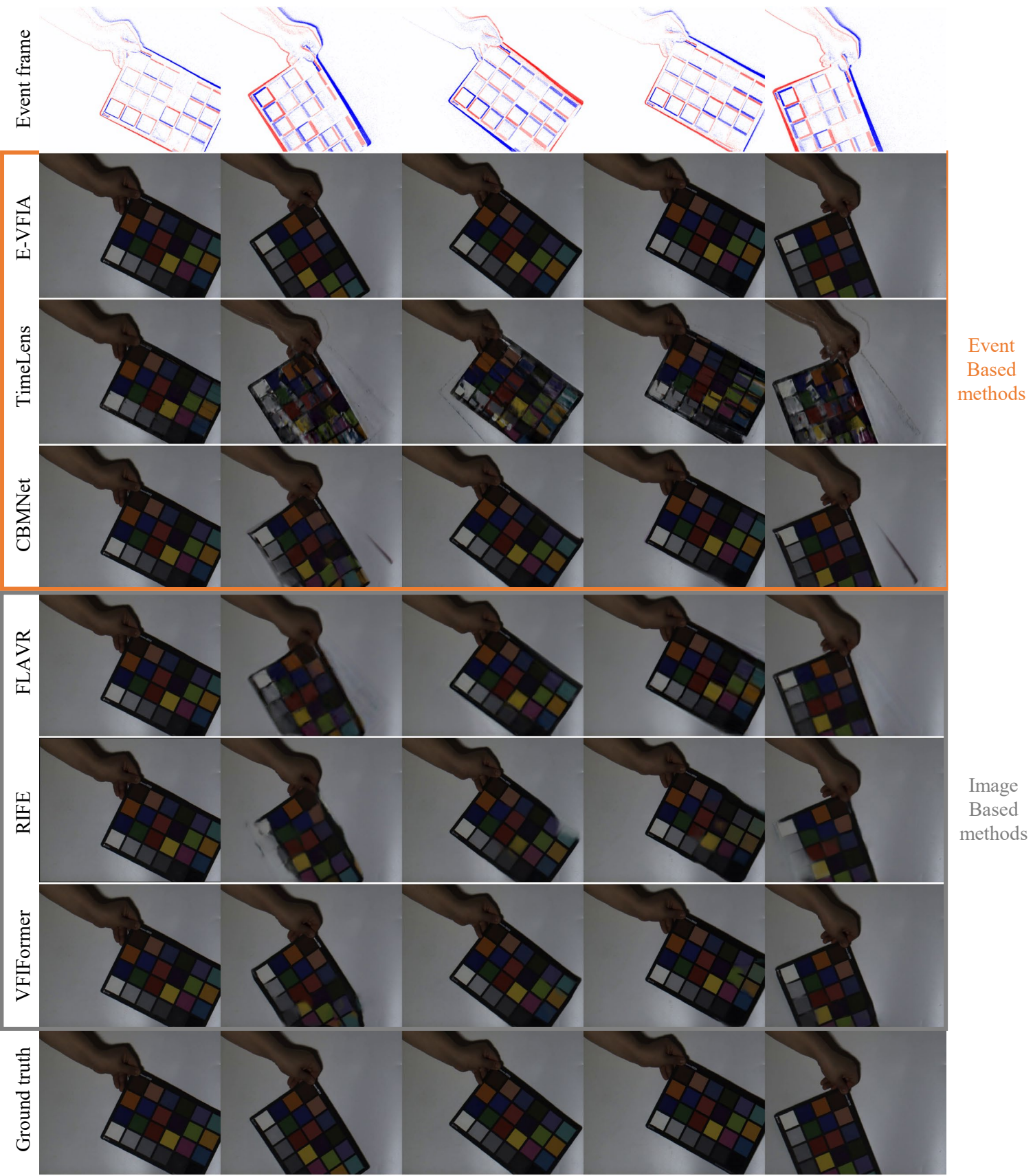
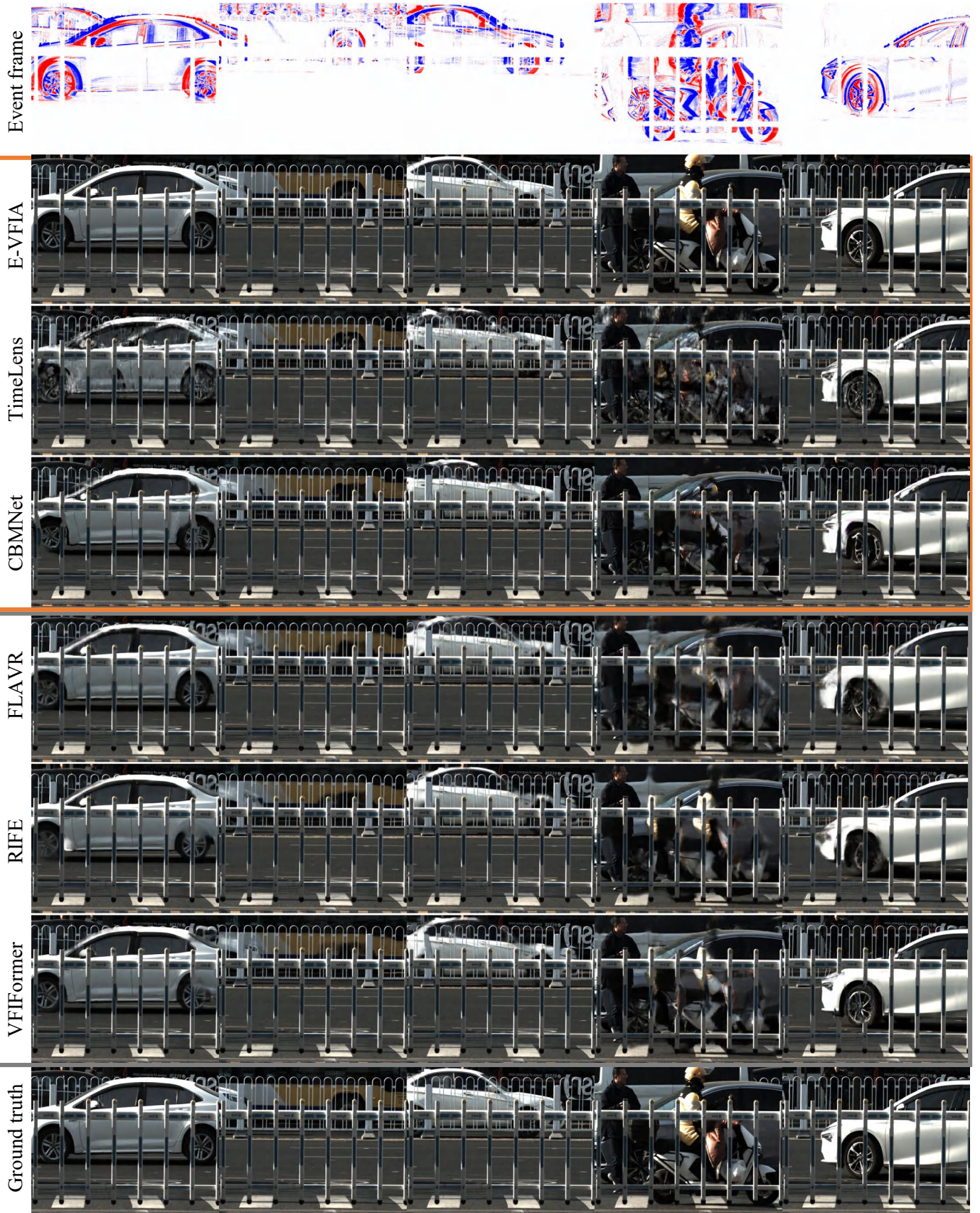


Figure S2-16: Comparison results of real-captured EVENTAID-F dataset (#6 F-ROOM2) (Compared with finetuned model)



Figure S2-17: Comparison results of real-captured EVENTAID-F dataset (#7 F-SCULPTURE) (Compared with finetuned model)

EVENTAID-F



Event Based methods

Image Based methods

Figure S2-18: Comparison results of real-captured EVENTAID-F dataset (#8 F-TRAFFIC) (Compared with finetuned model)

EVENTAID-F

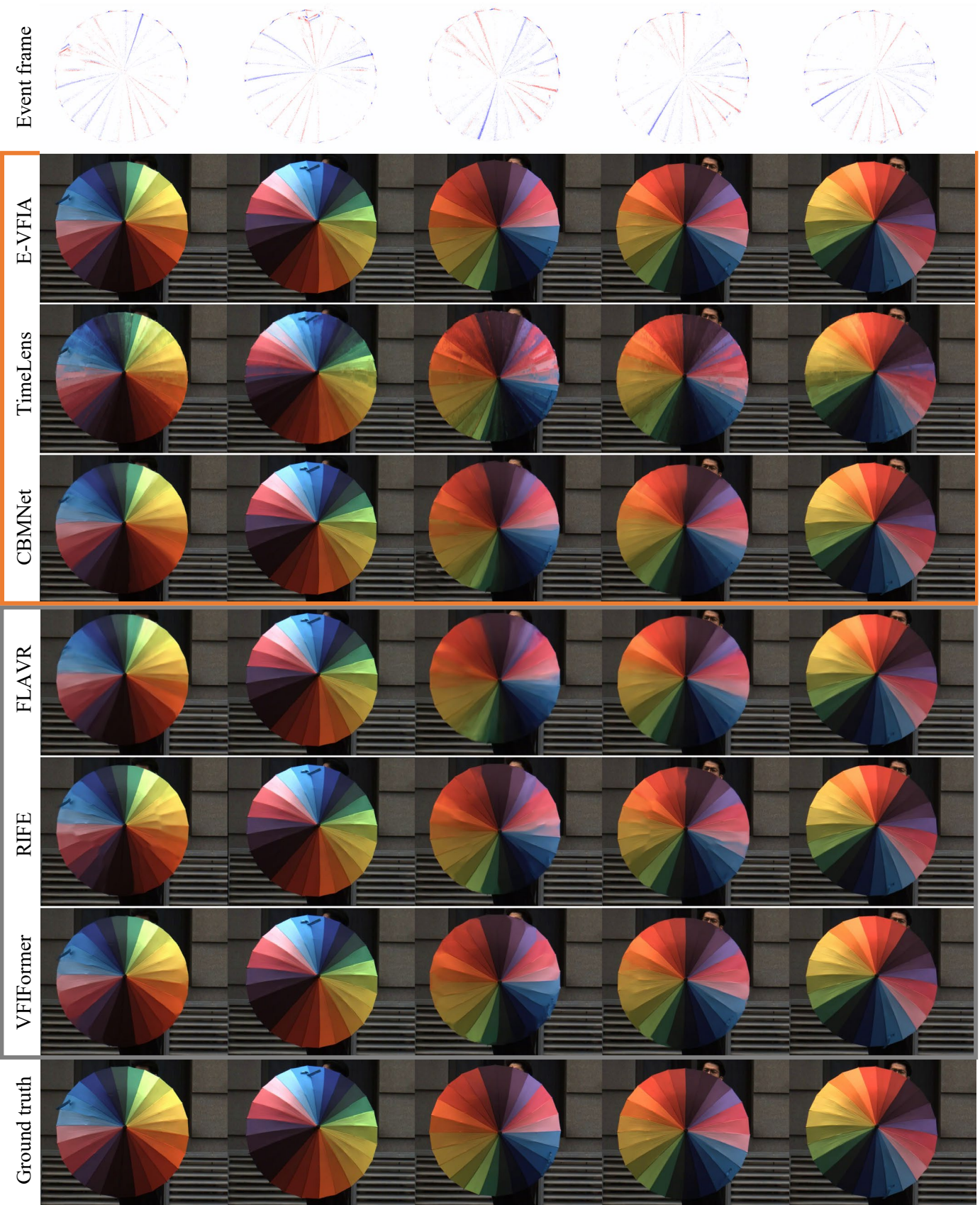


Figure S2-19: Comparison results of real-captured EVENTAID-F dataset (#9 F-UMBRELLA) (Compared with finetuned model)

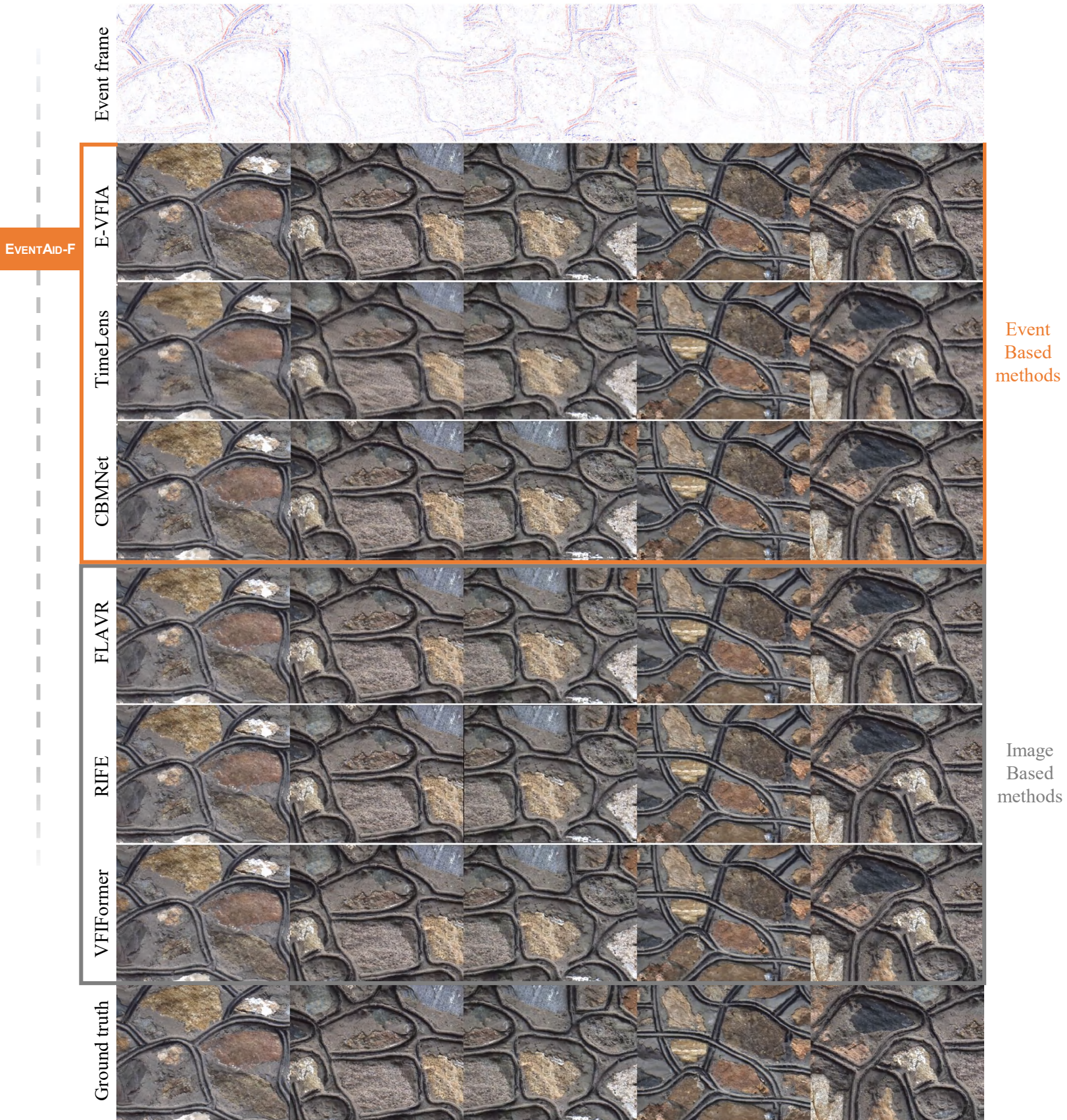


Figure S2-20: Comparison results of real-captured EVENTAID-F dataset (#10 F-WALL)
 (Compared with finetuned model)

2.2 Results on simulated EVENTAID-F-V2E dataset

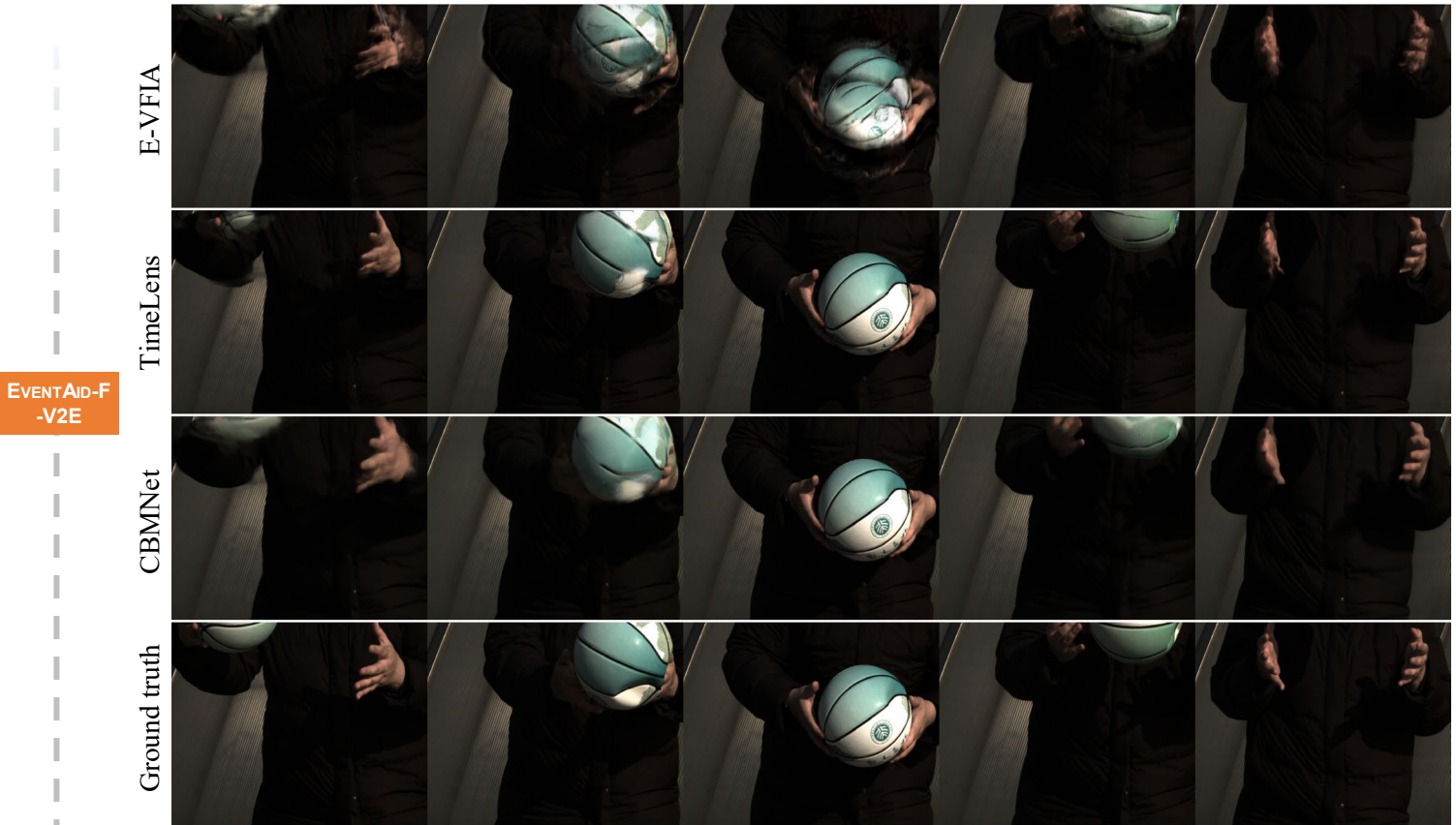


Figure S2-21: Comparison results of simulated EVENTAID-F-V2E dataset (#1 F-BALL)

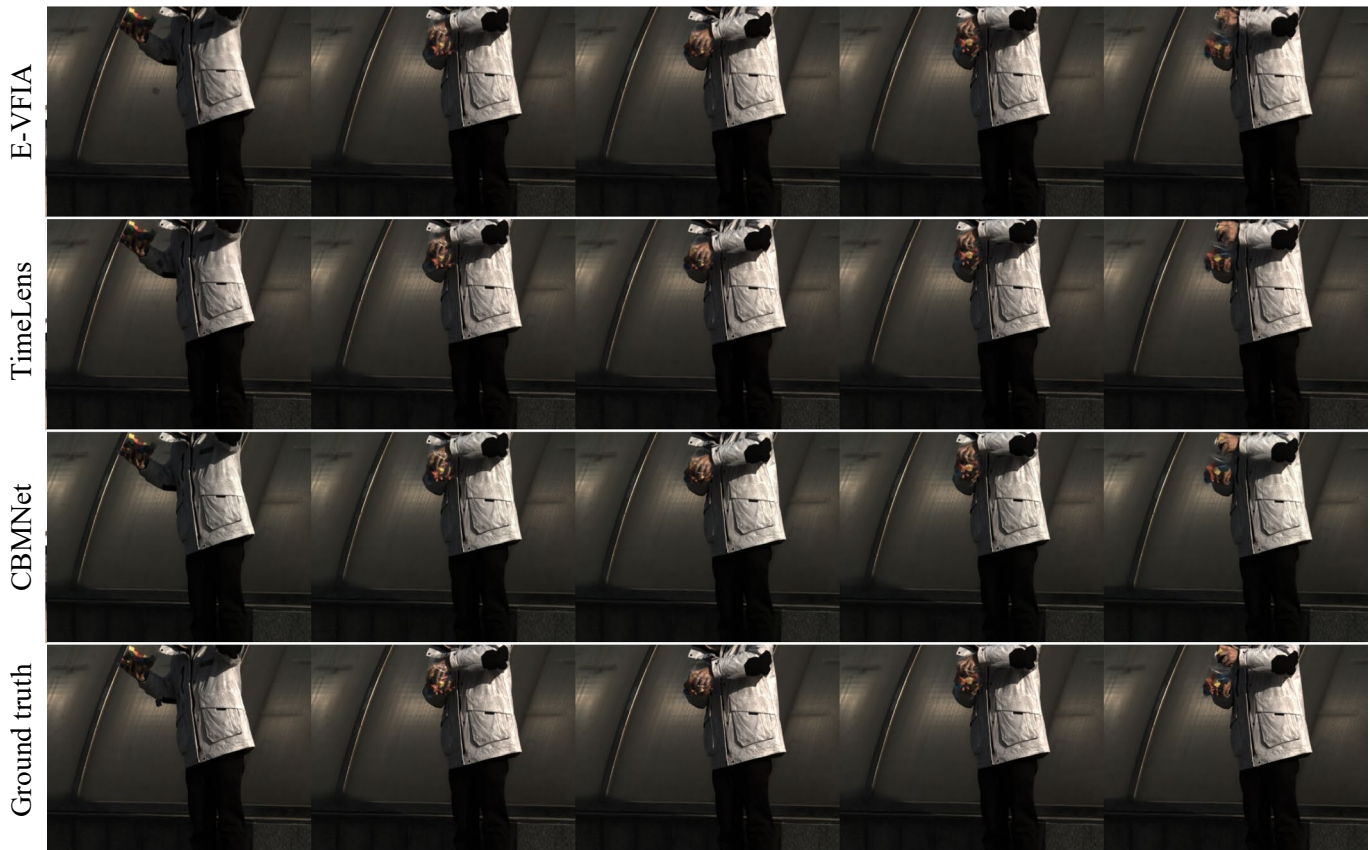


Figure S2-22: Comparison results of simulated EVENTAID-F-V2E dataset (#2 F-BLOCKS)

EVENTAID-F-V2E

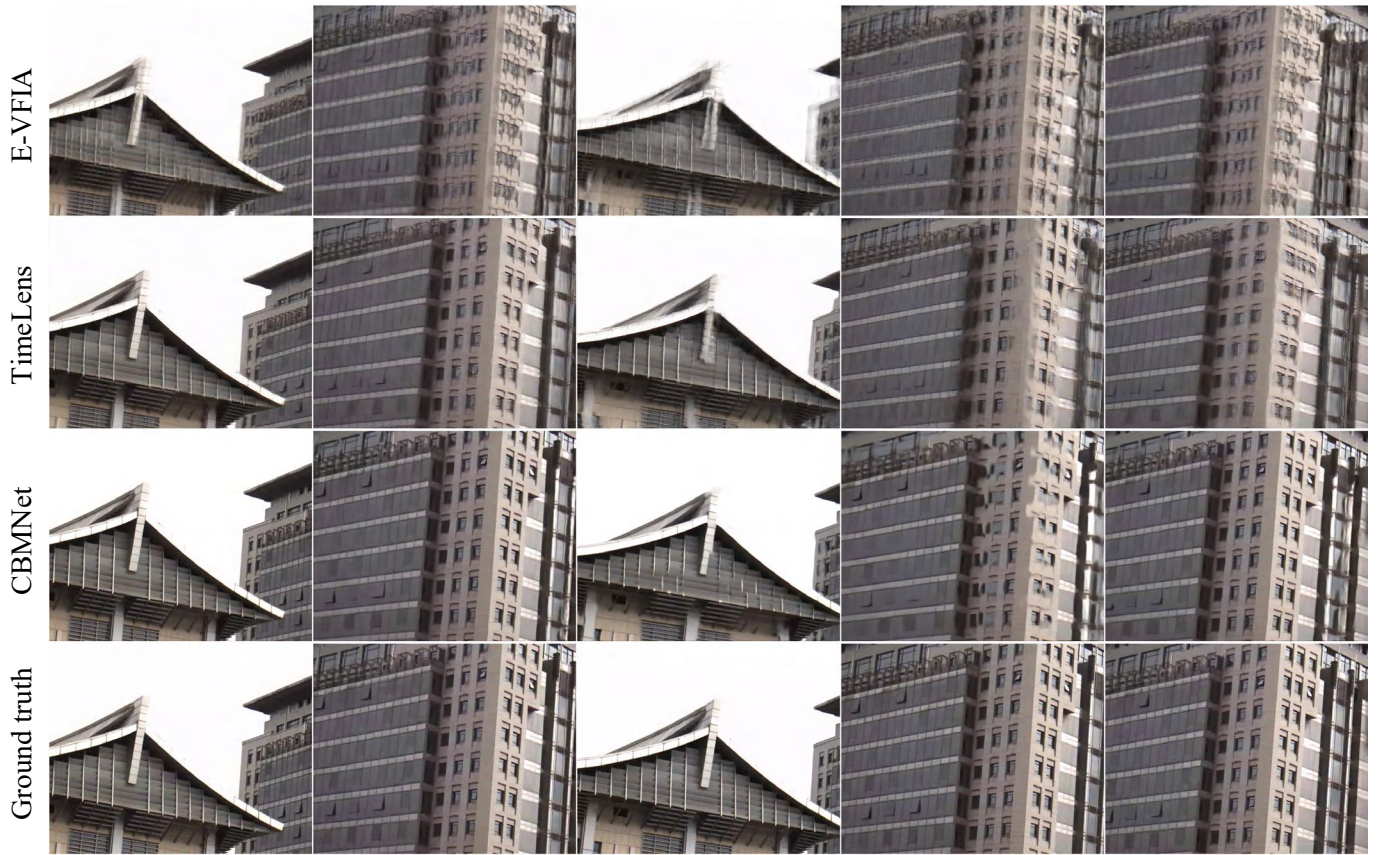


Figure S2-23: Comparison results of simulated EVENTAID-F-V2E dataset (#3 F-BUILDING)



Figure S2-24: Comparison results of simulated EVENTAID-F-V2E dataset (#4 F-PLAYBALL)

EVENTAID-F-V2E

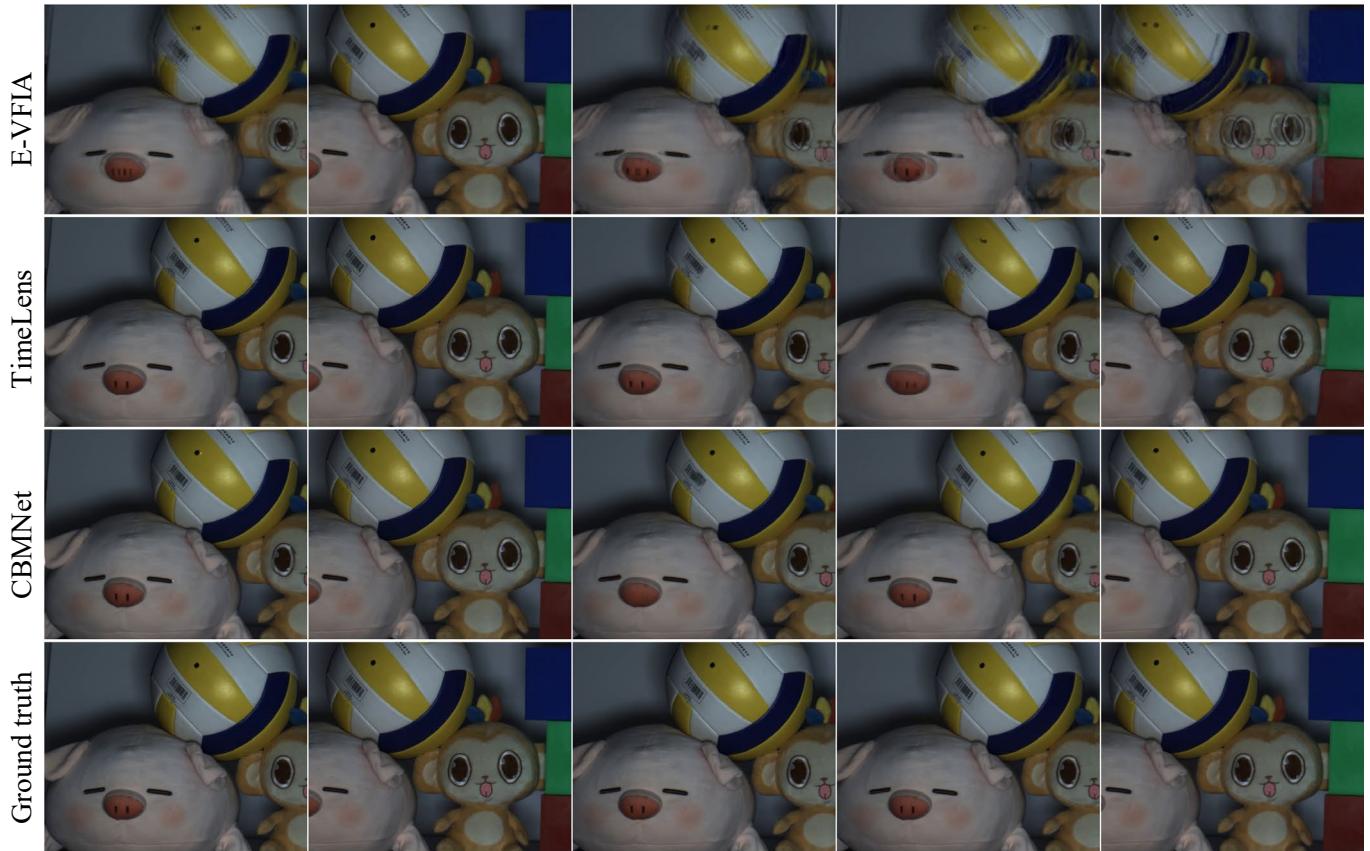


Figure S2-25: Comparison results of simulated EVENTAID-F-V2E dataset (#5 F-ROOM1)



Figure S2-26: Comparison results of simulated EVENTAID-F-V2E dataset (#6 F-ROOM2)

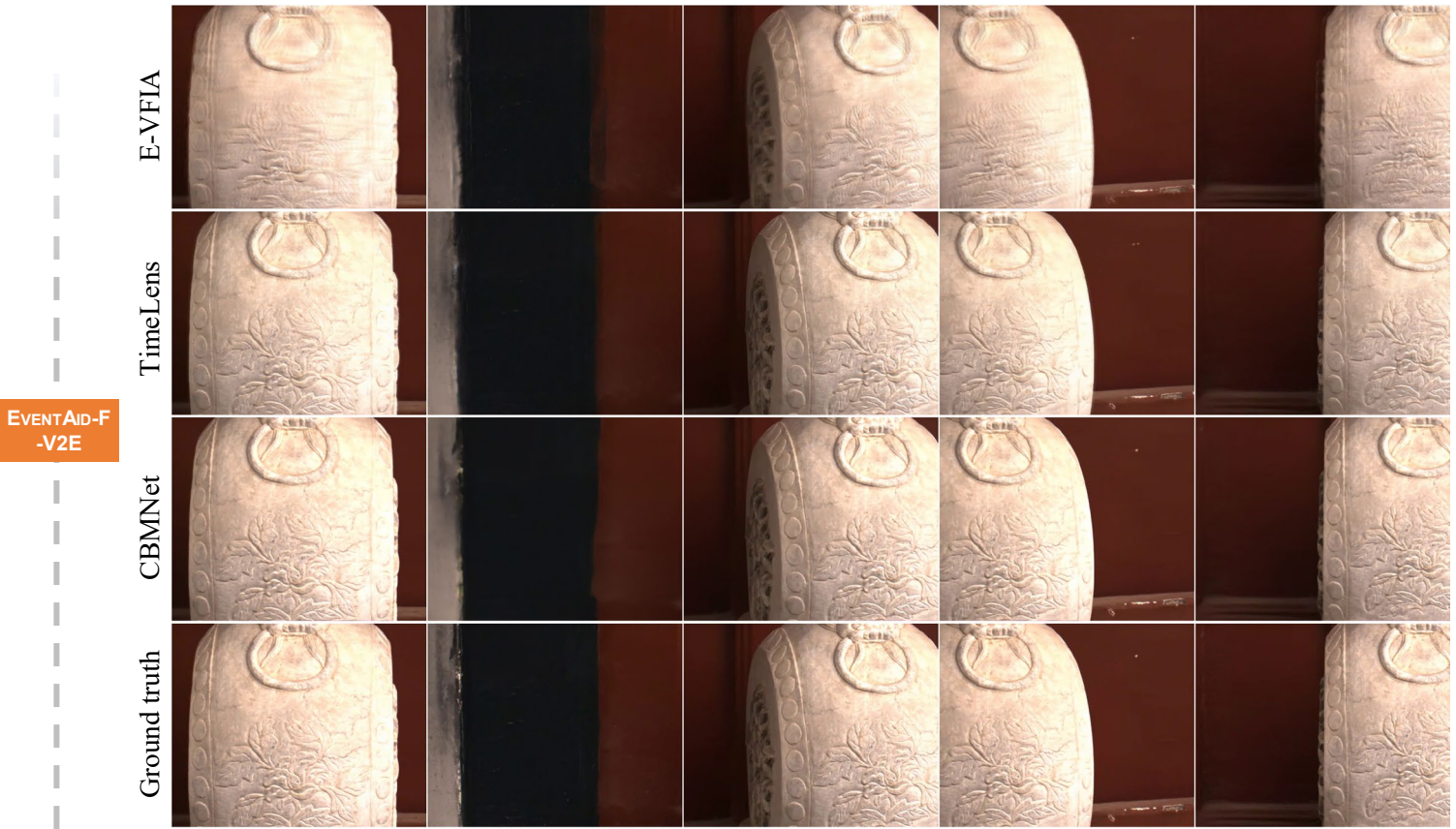


Figure S2-27: Comparison results of simulated EVENTAID-F-V2E dataset (#7 F-SCULPTURE)



Figure S2-28: Comparison results of simulated EVENTAID-F-V2E dataset (#8 F-TRAFFIC)

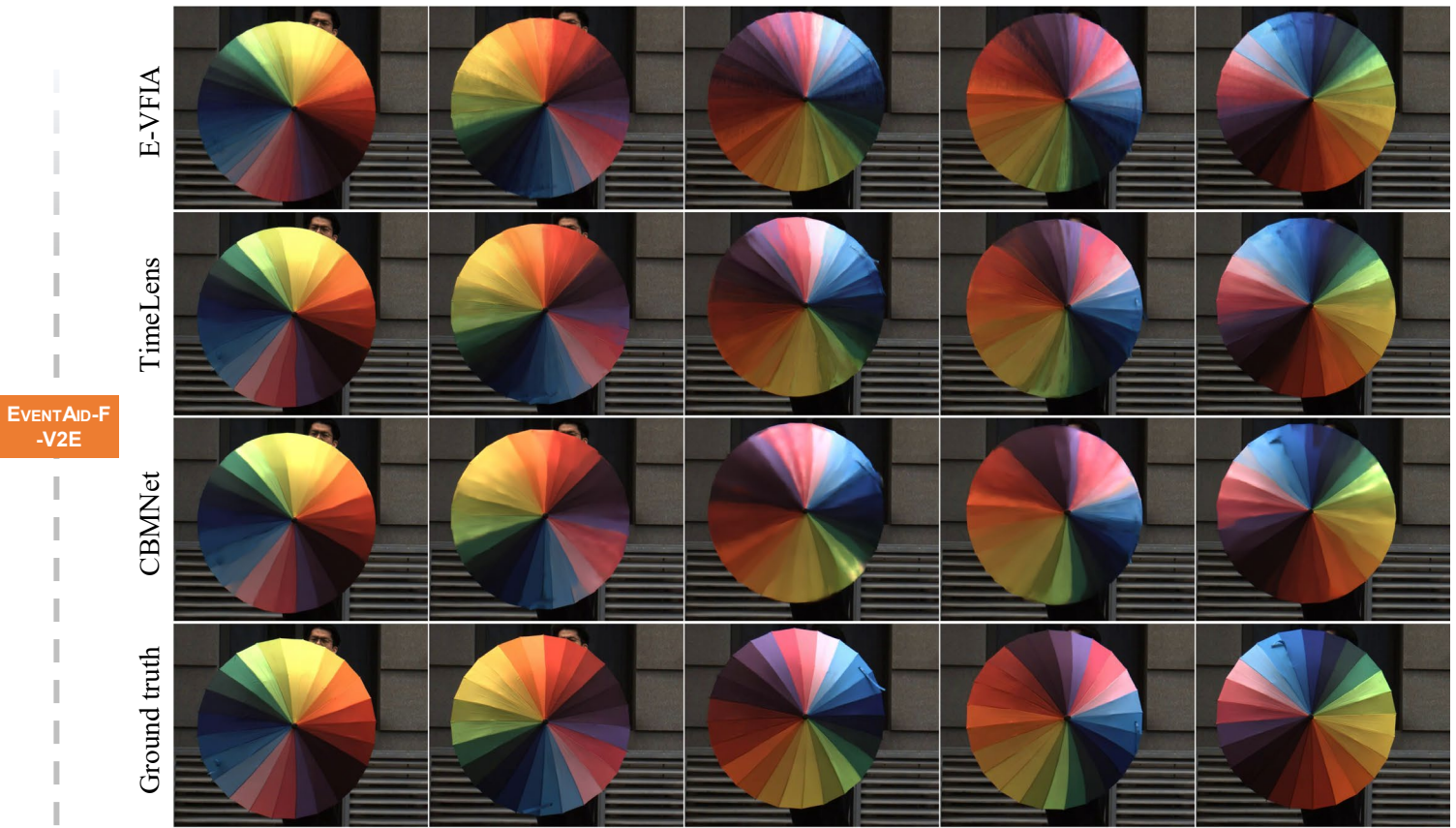


Figure S2-29: Comparison results of simulated EVENTAID-F-V2E dataset (#9 F-UMBRELLA)

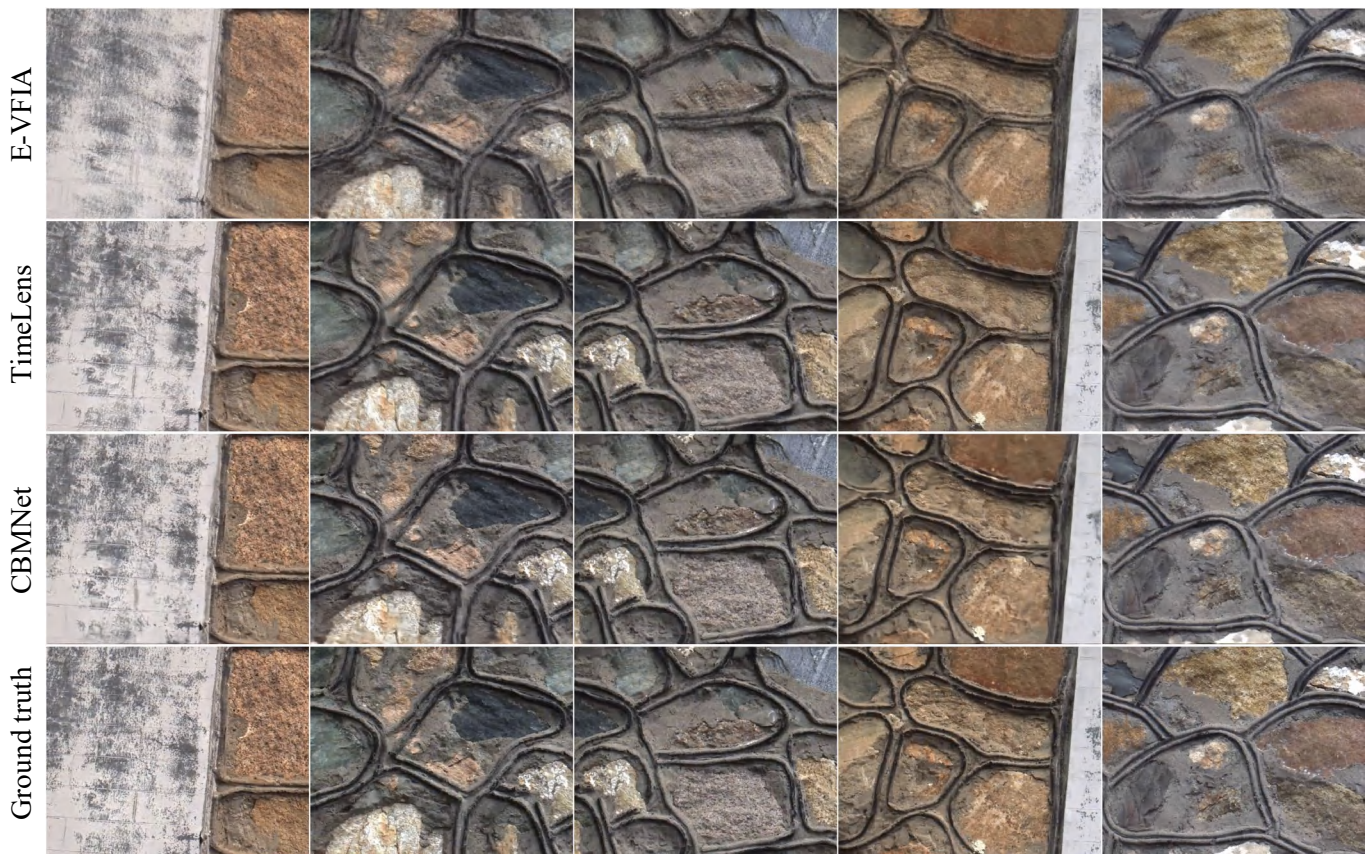


Figure S2-30: Comparison results of simulated EVENTAID-F-V2E dataset (#10 F-WALL)

2.3 Results on simulated EVENTAID-F-VM dataset

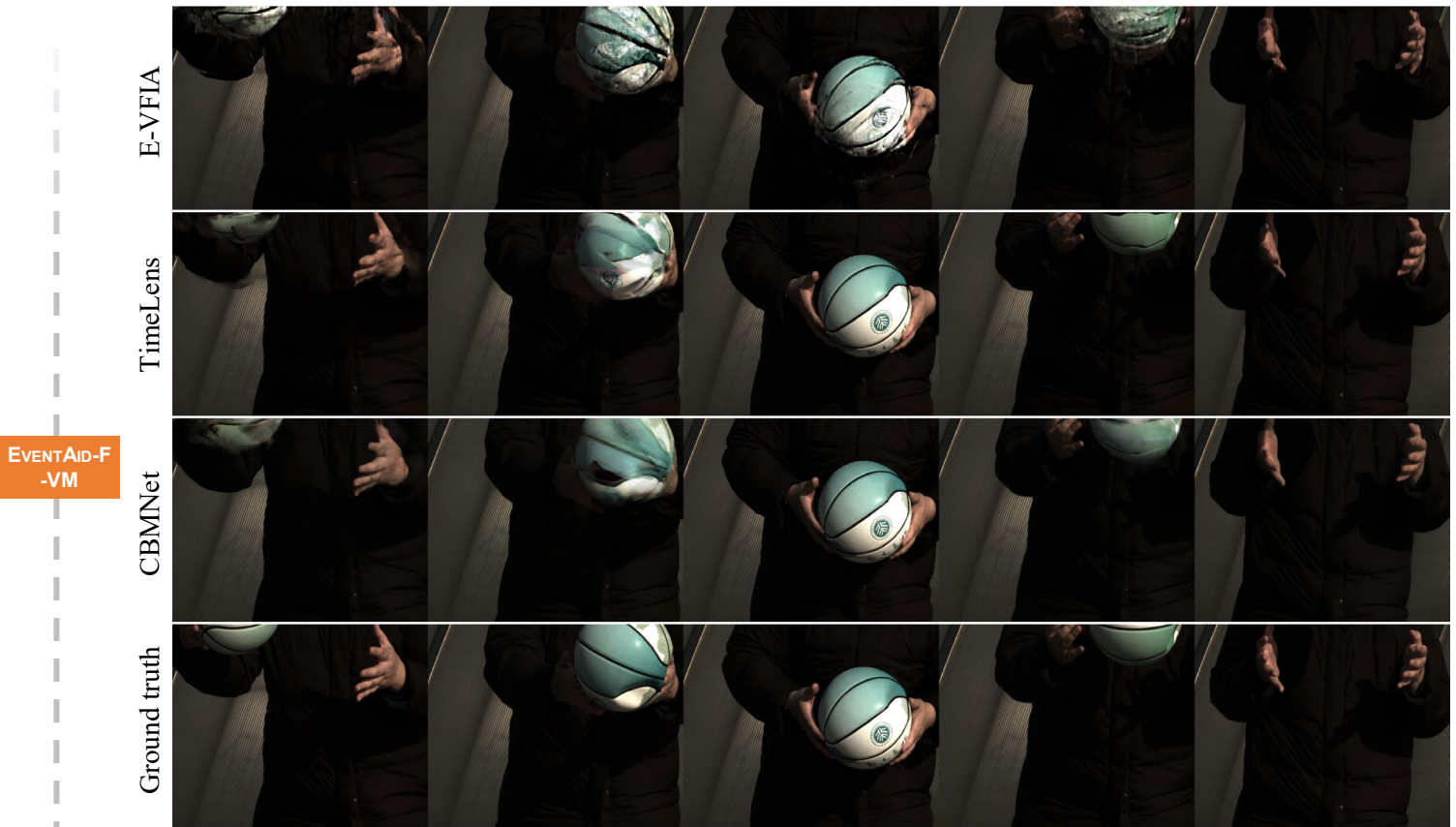


Figure S2-31: Comparison results of simulated EVENTAID-F-VM dataset (#1 F-BALL)

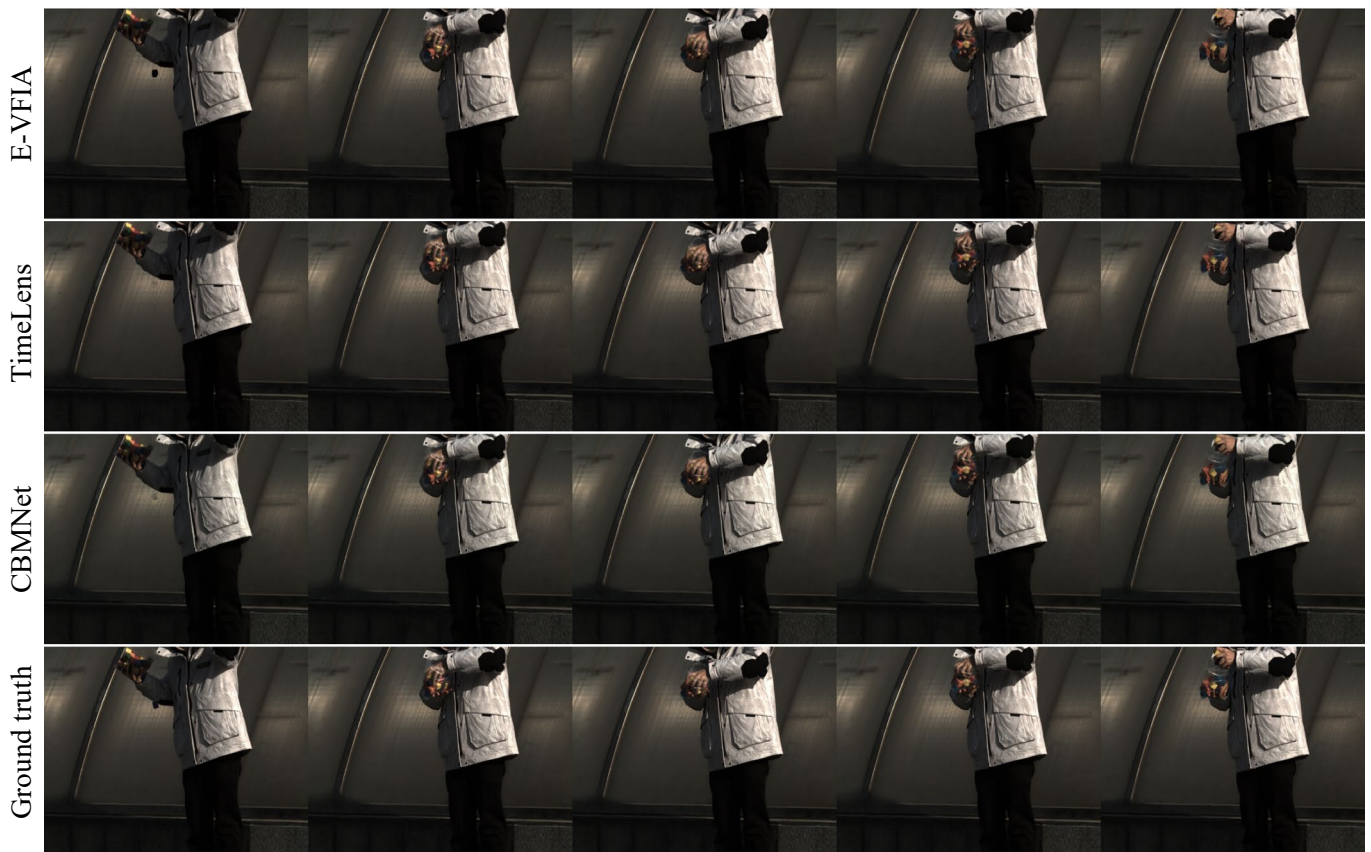


Figure S2-32: Comparison results of simulated EVENTAID-F-VM dataset (#2 F-BLOCKS)

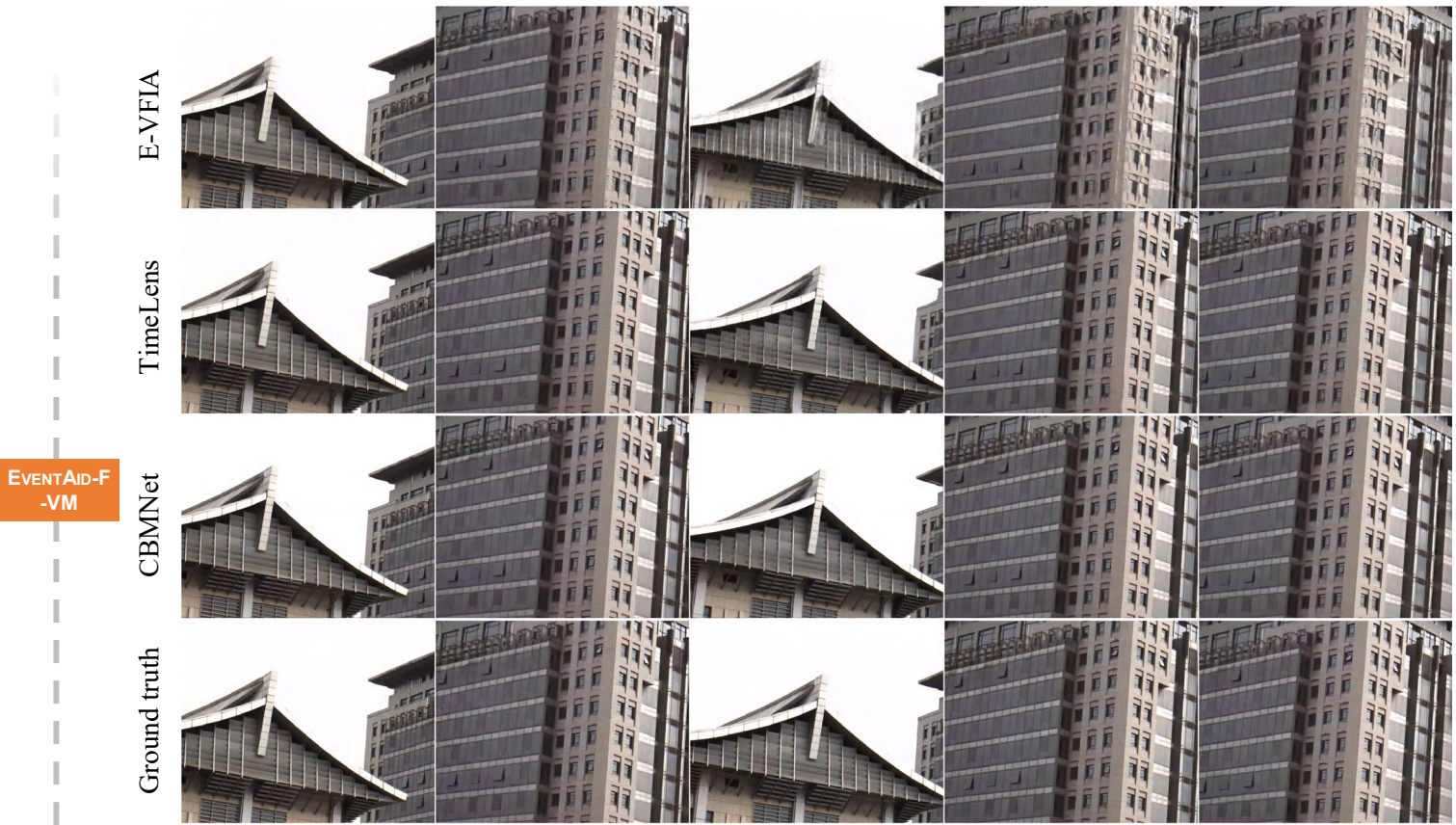


Figure S2-33: Comparison results of simulated EVENTAID-F-VM dataset (#3 F-BUILDING)



Figure S2-34: Comparison results of simulated EVENTAID-F-VM dataset (#4 F-PLAYBALL)

EVENTAID-F-VM



Figure S2-35: Comparison results of simulated EVENTAID-F-VM dataset (#5 F-ROOM1)



Figure S2-36: Comparison results of simulated EVENTAID-F-VM dataset (#6 F-ROOM2)

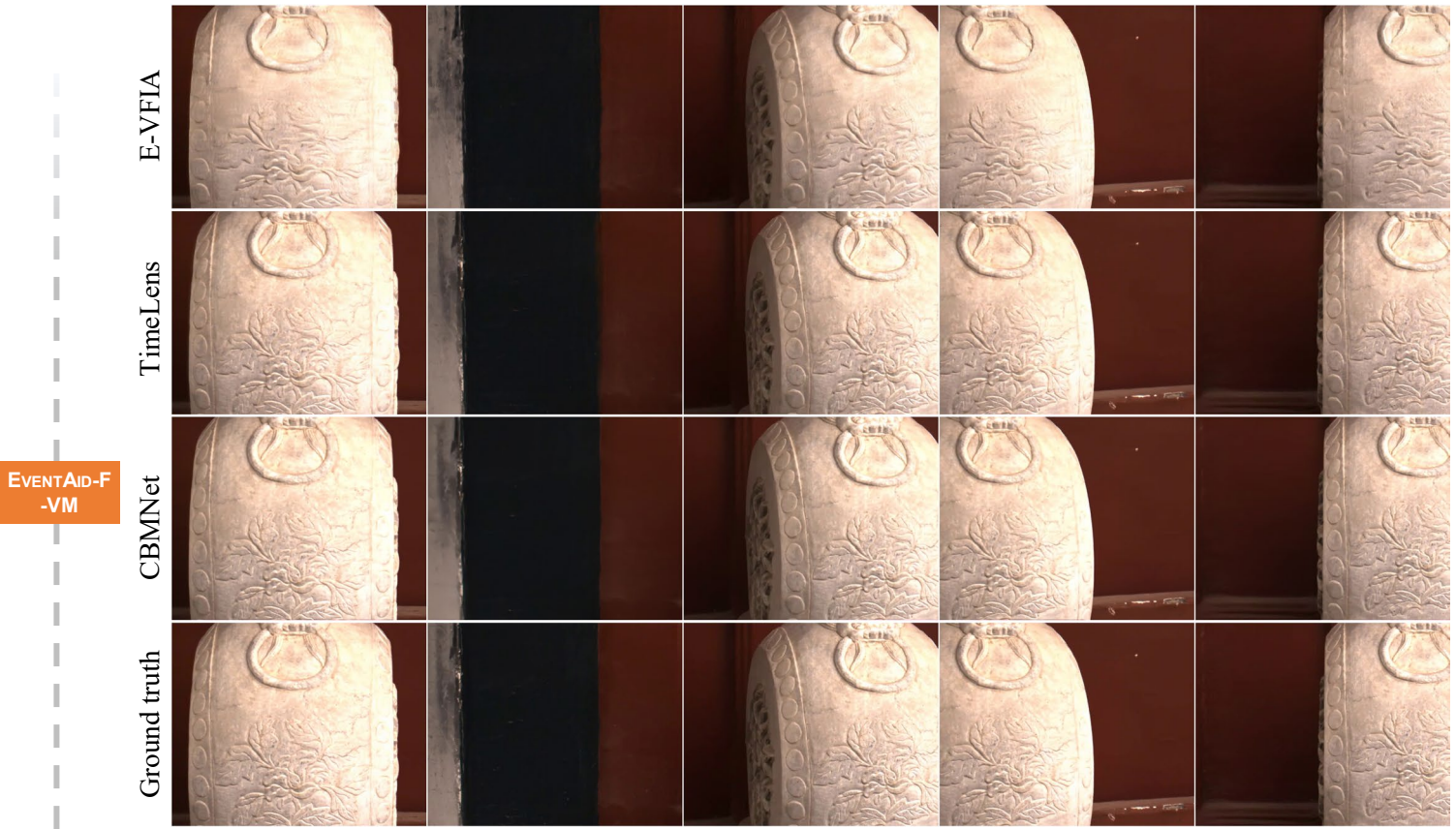


Figure S2-37: Comparison results of simulated EVENTAID-F-VM dataset (#7 F-SCULPTURE)



Figure S2-38: Comparison results of simulated EVENTAID-F-VM dataset (#8 F-TRAFFIC)

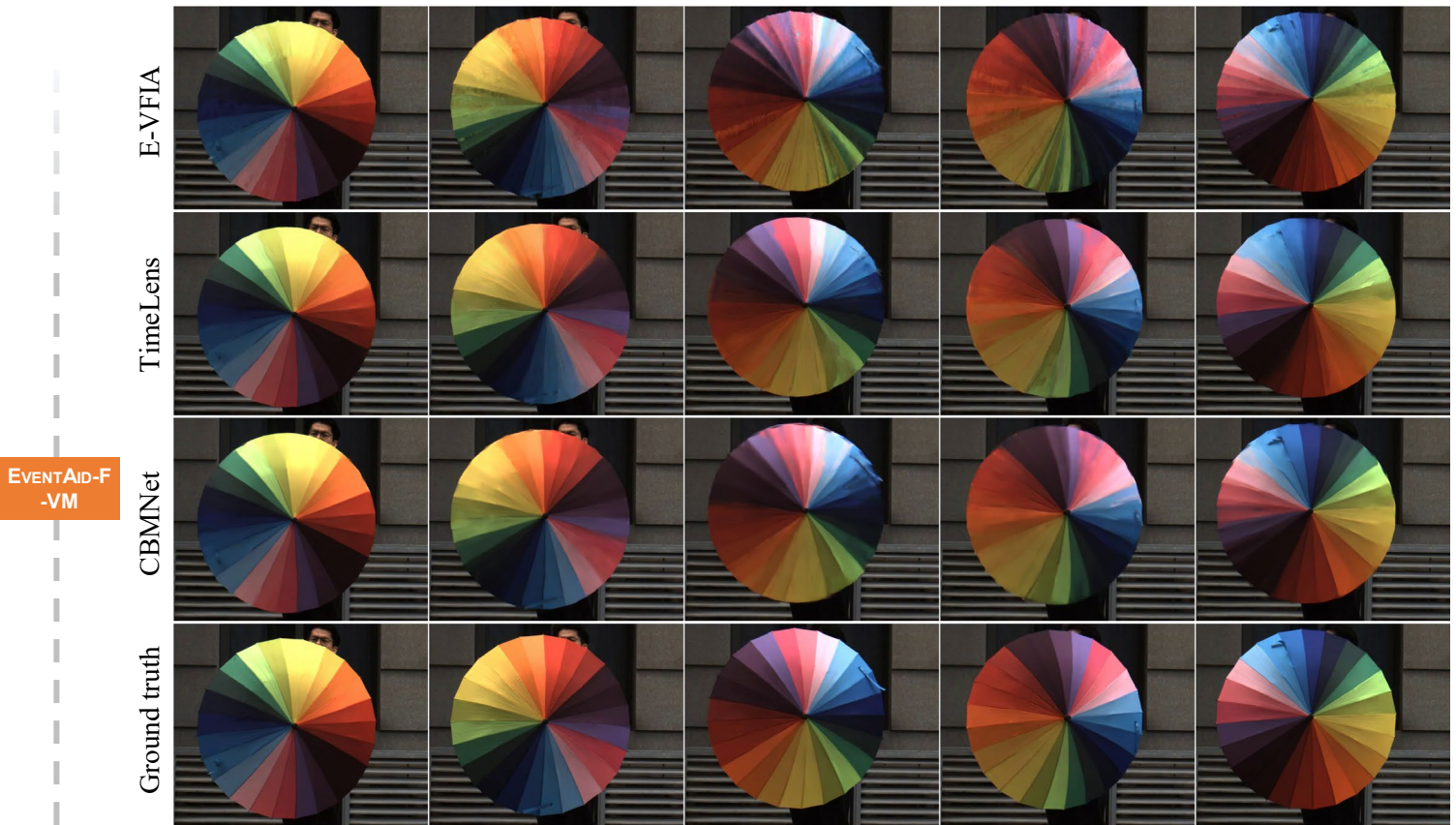


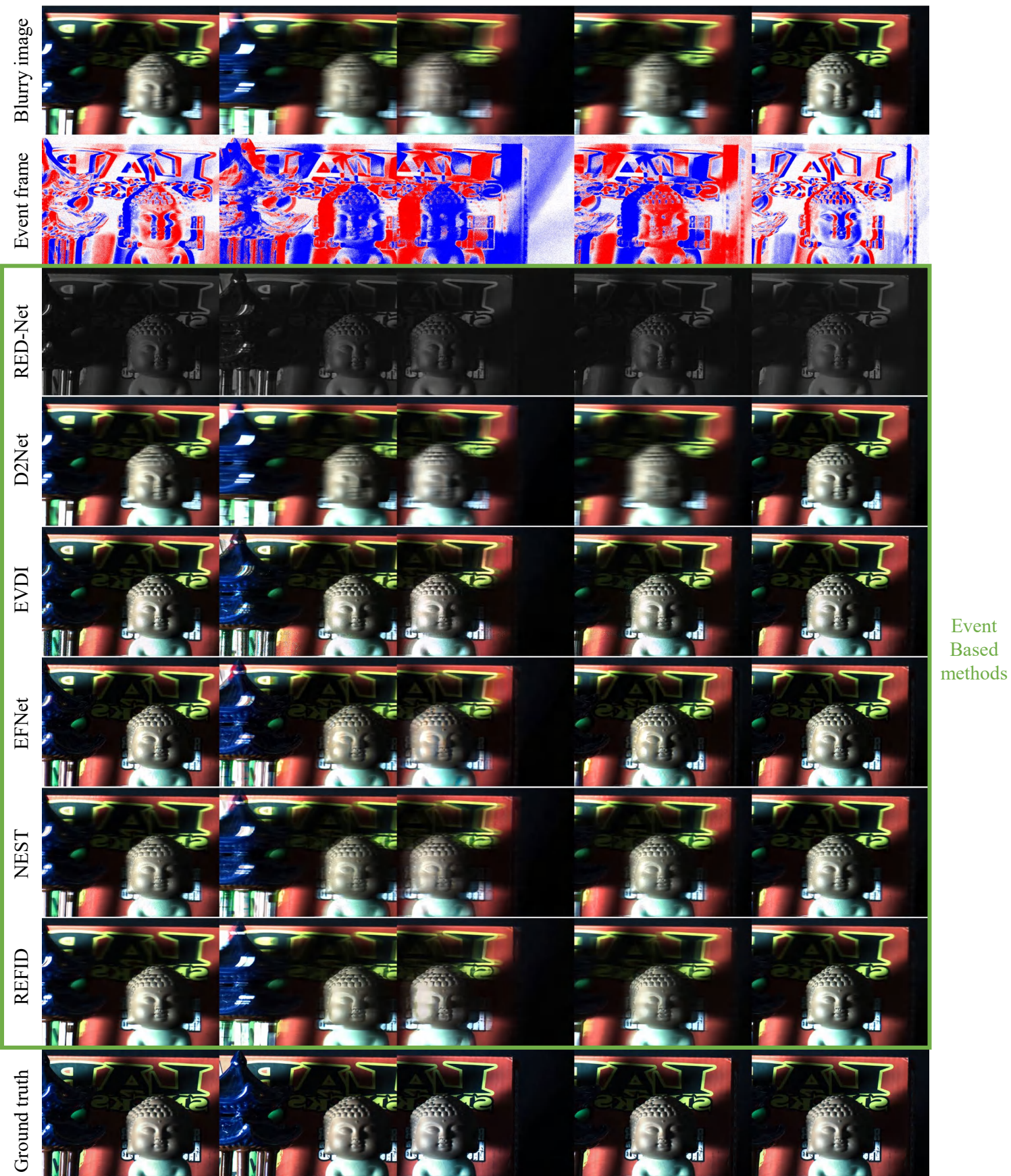
Figure S2-39: Comparison results of simulated EVENTAID-F-VM dataset (#9 F-UMBRELLA)



Figure S2-40: Comparison results of simulated EVENTAID-F-VM dataset (#10 F-WALL)

3 QUALITATIVE COMPARISON RESULTS: EVENT-AIDED IMAGE DEBLURRING

3.1 Results on real-captured EVENTAID-B dataset



Event Based methods

Figure S3-1: Comparison results of real-captured EVENTAID-B dataset (#1 B-BOX) (Compared with pretrained model)

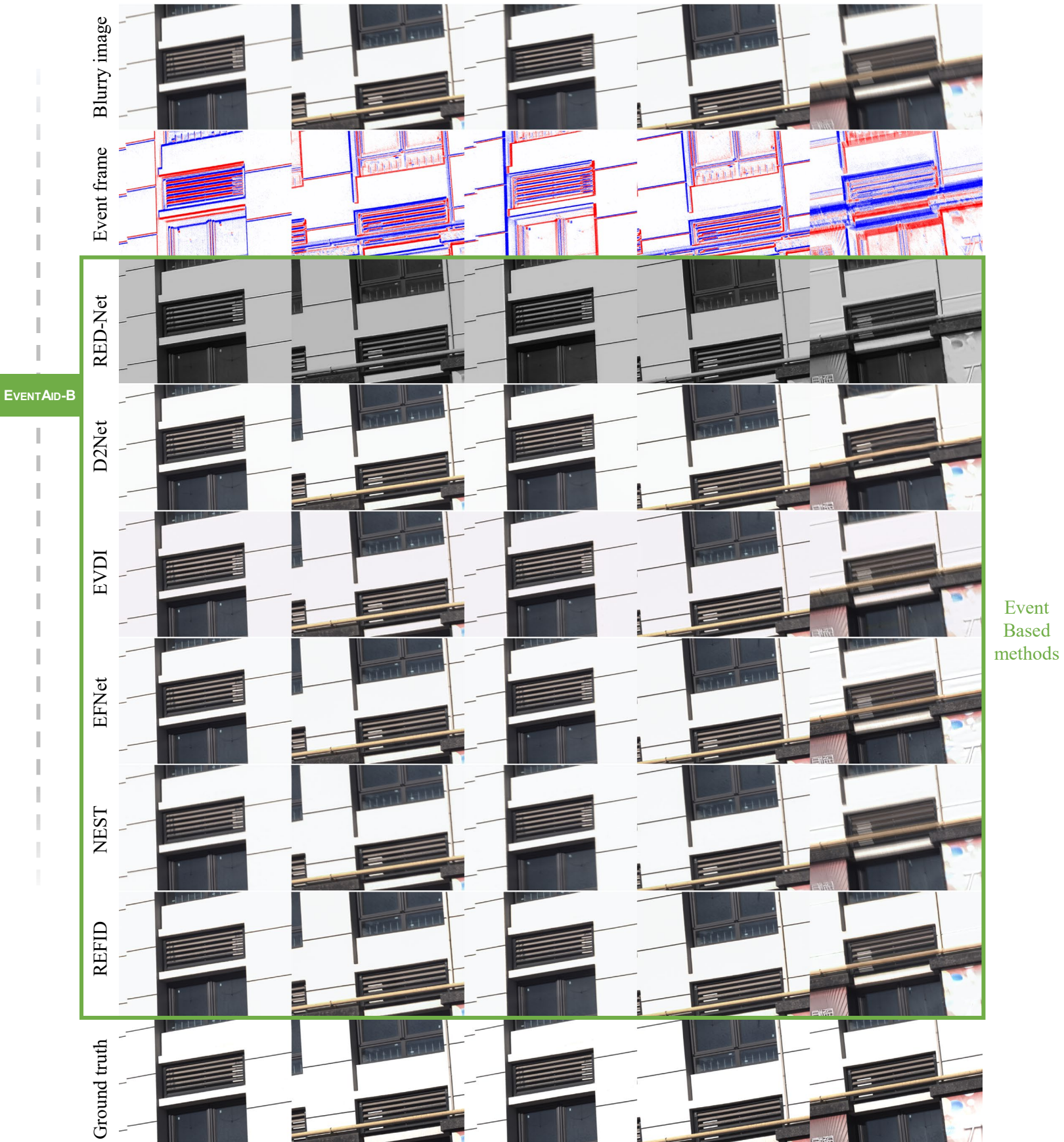


Figure S3-2: Comparison results of real-captured EVENTAID-B dataset (#2 B-BUILDING)
(Compared with pretrained model)



Figure S3-3: Comparison results of real-captured EVENTAID-B dataset (#3 B-DANCE) (Compared with pretrained model)

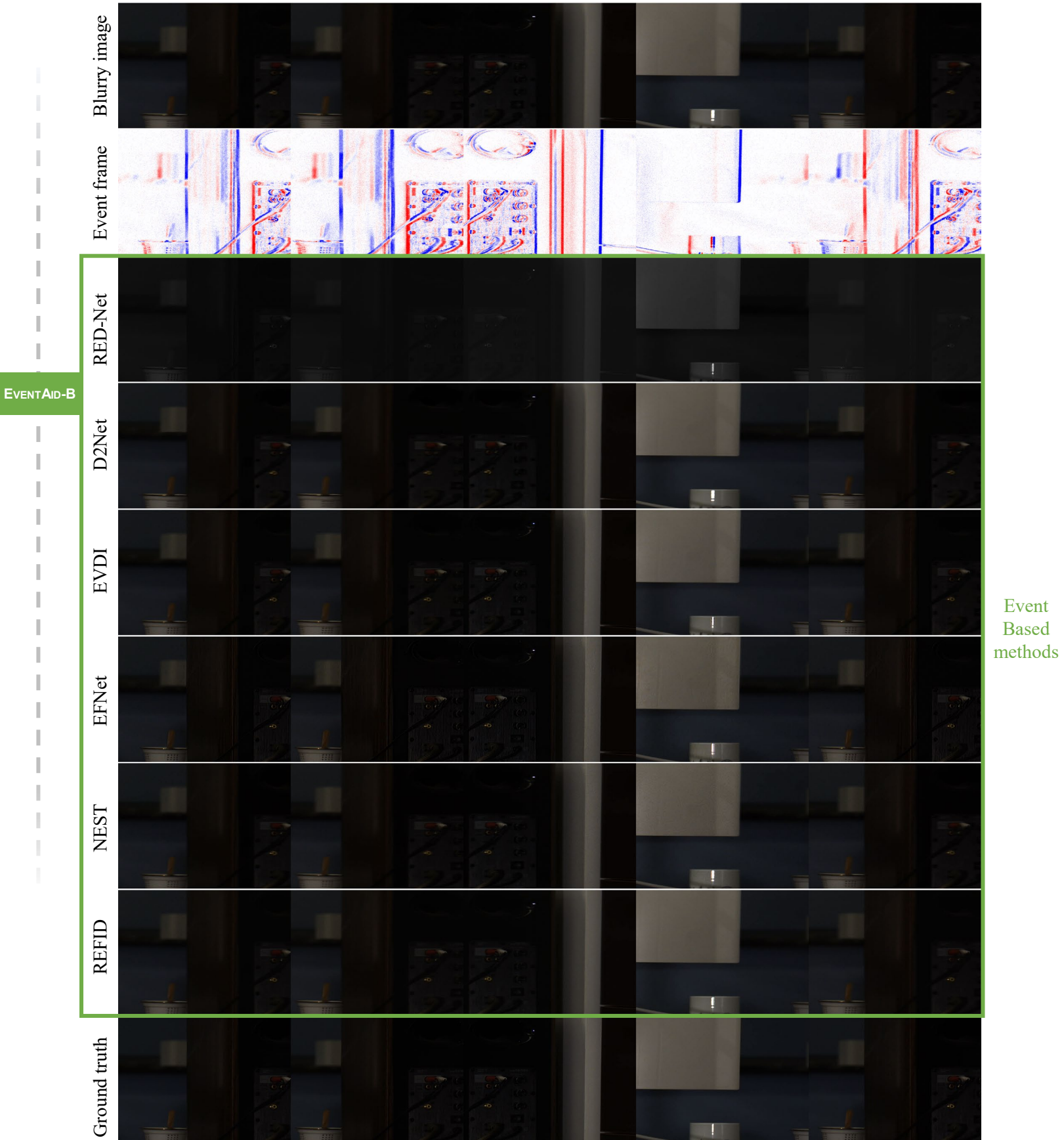


Figure S3-4: Comparison results of real-captured EVENTAID-B dataset (#4 B-DESK)
 (Compared with pretrained model)

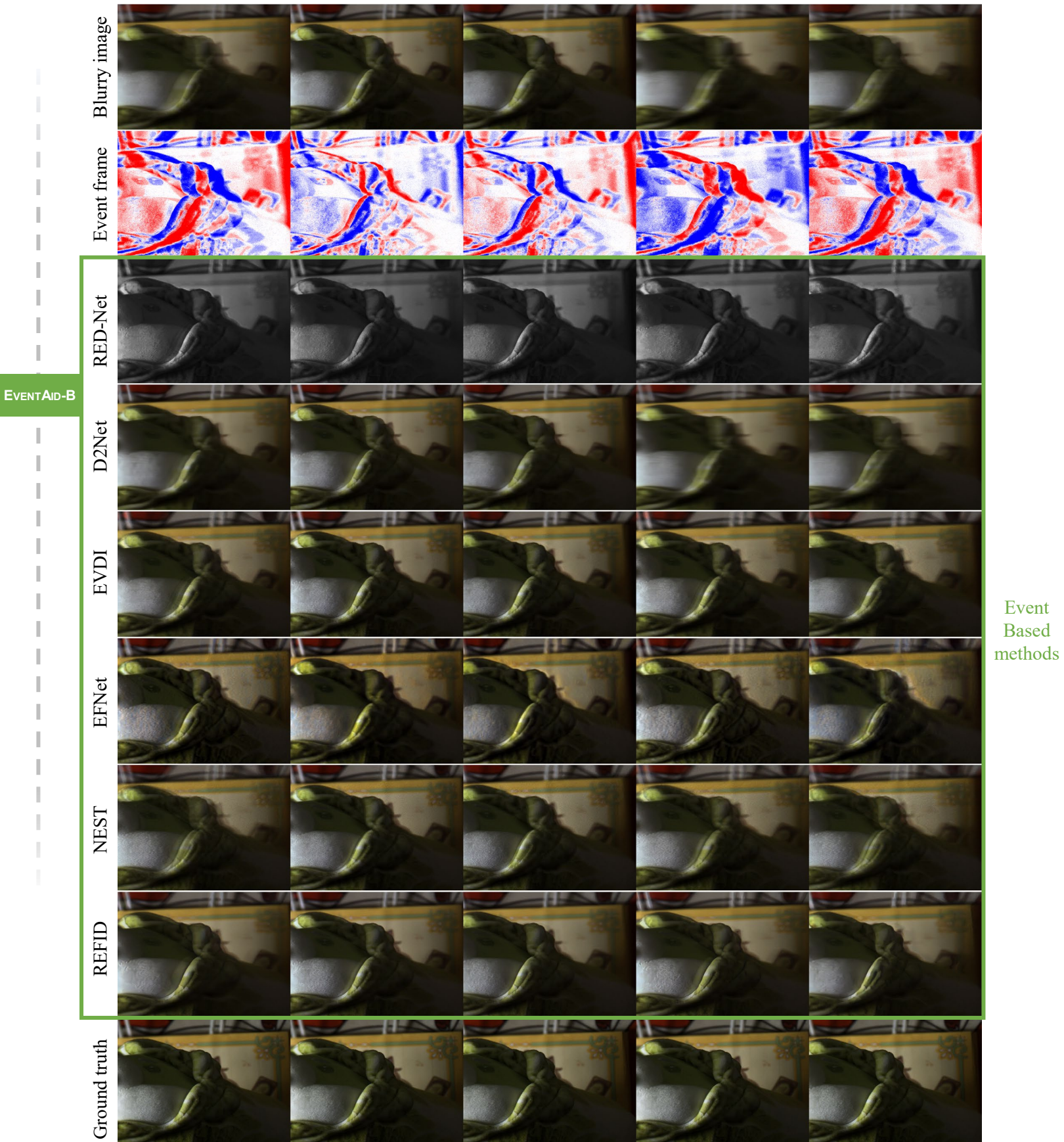


Figure S3-5: Comparison results of real-captured EVENTAID-B dataset (#5 B-DOG)
(Compared with pretrained model)

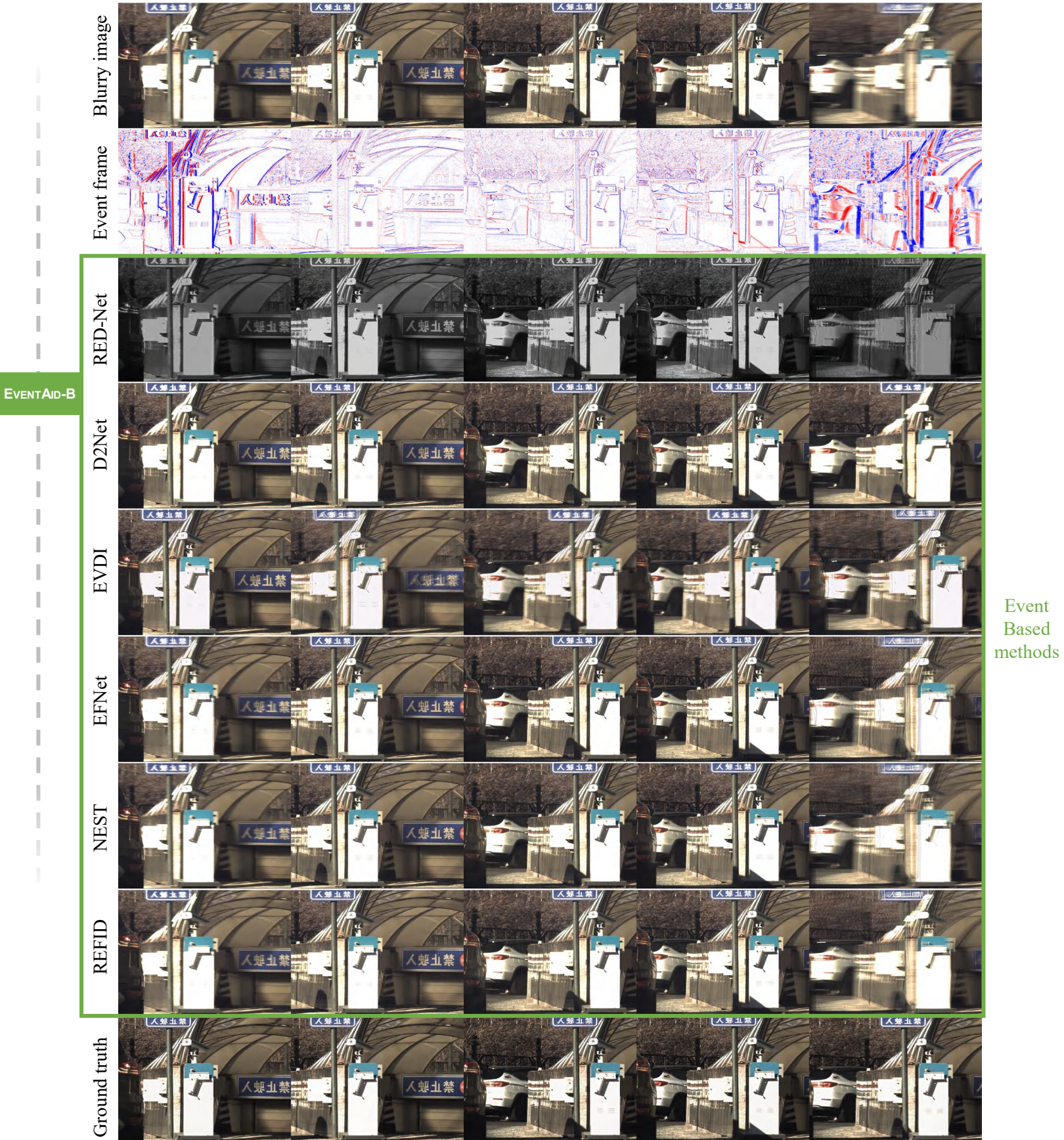
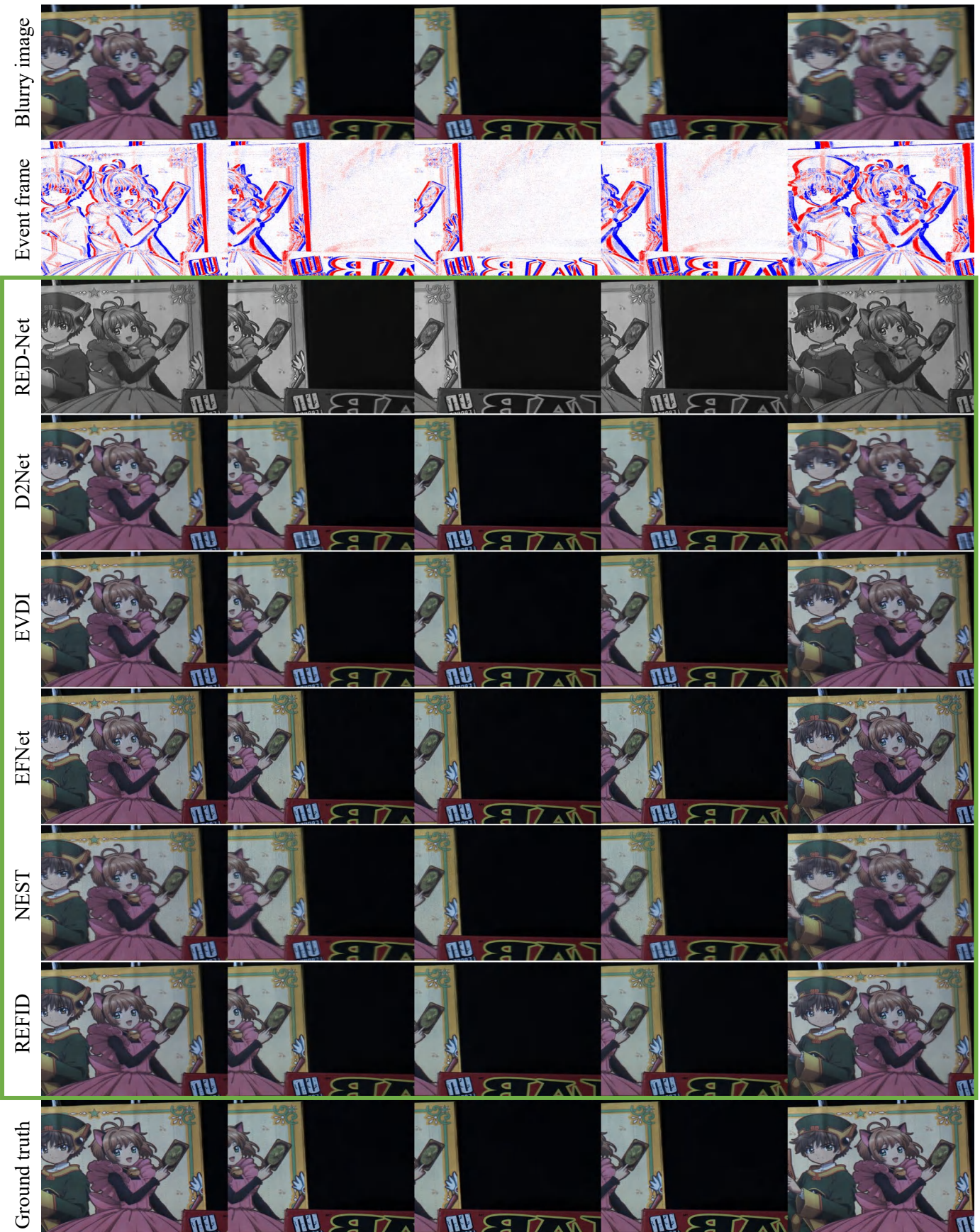


Figure S3-6: Comparison results of real-captured EVENTAID-B dataset (#6 B-ENTRANCE) (Compared with pretrained model)

EVENTAID-B



Event Based methods

Figure S3-7: Comparison results of real-captured EVENTAID-B dataset (#7 B-GLOBAL) (Compared with pretrained model)

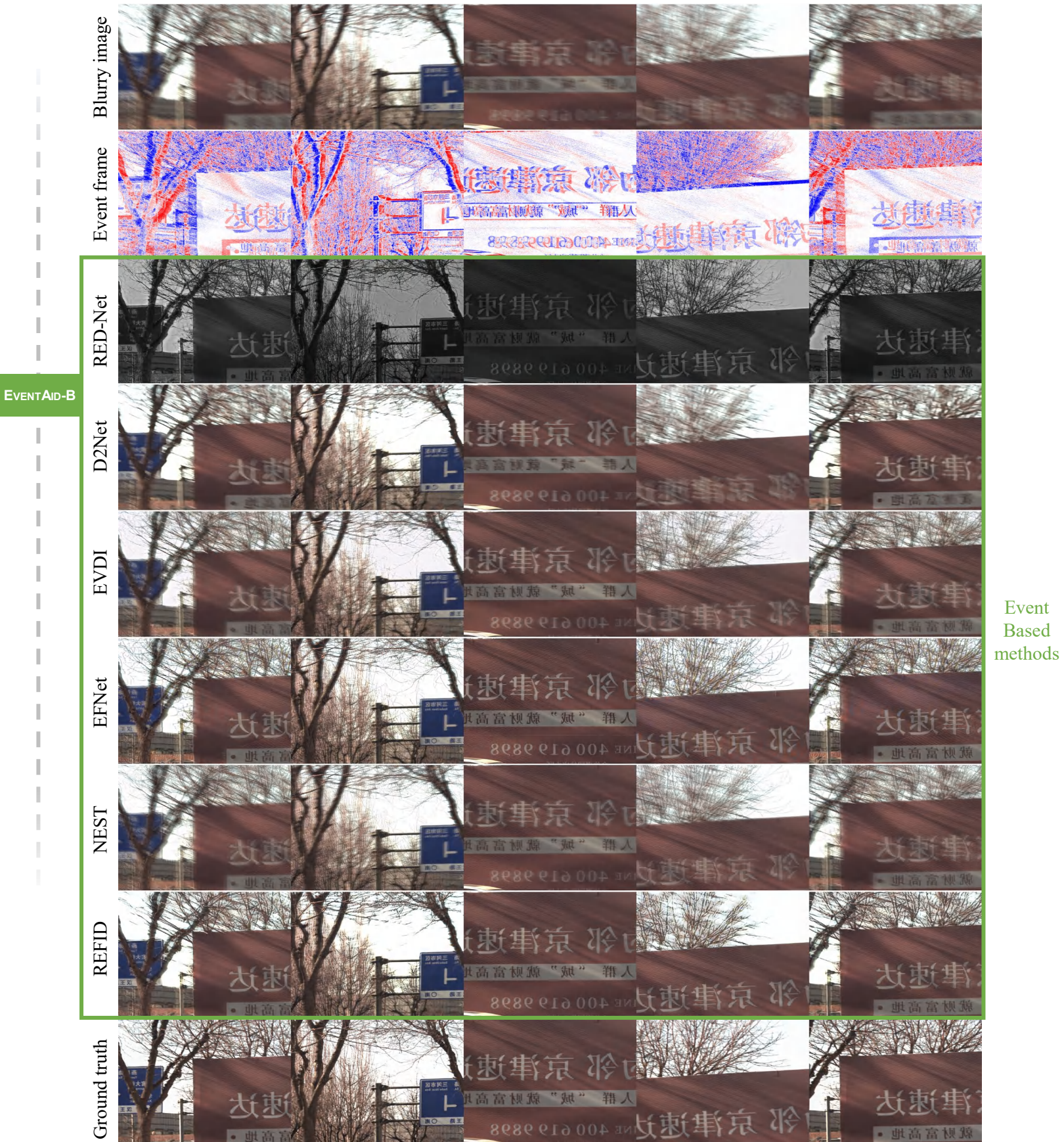


Figure S3-8: Comparison results of real-captured EVENTAID-B dataset (#8 B-JINGJIN) (Compared with pretrained model)

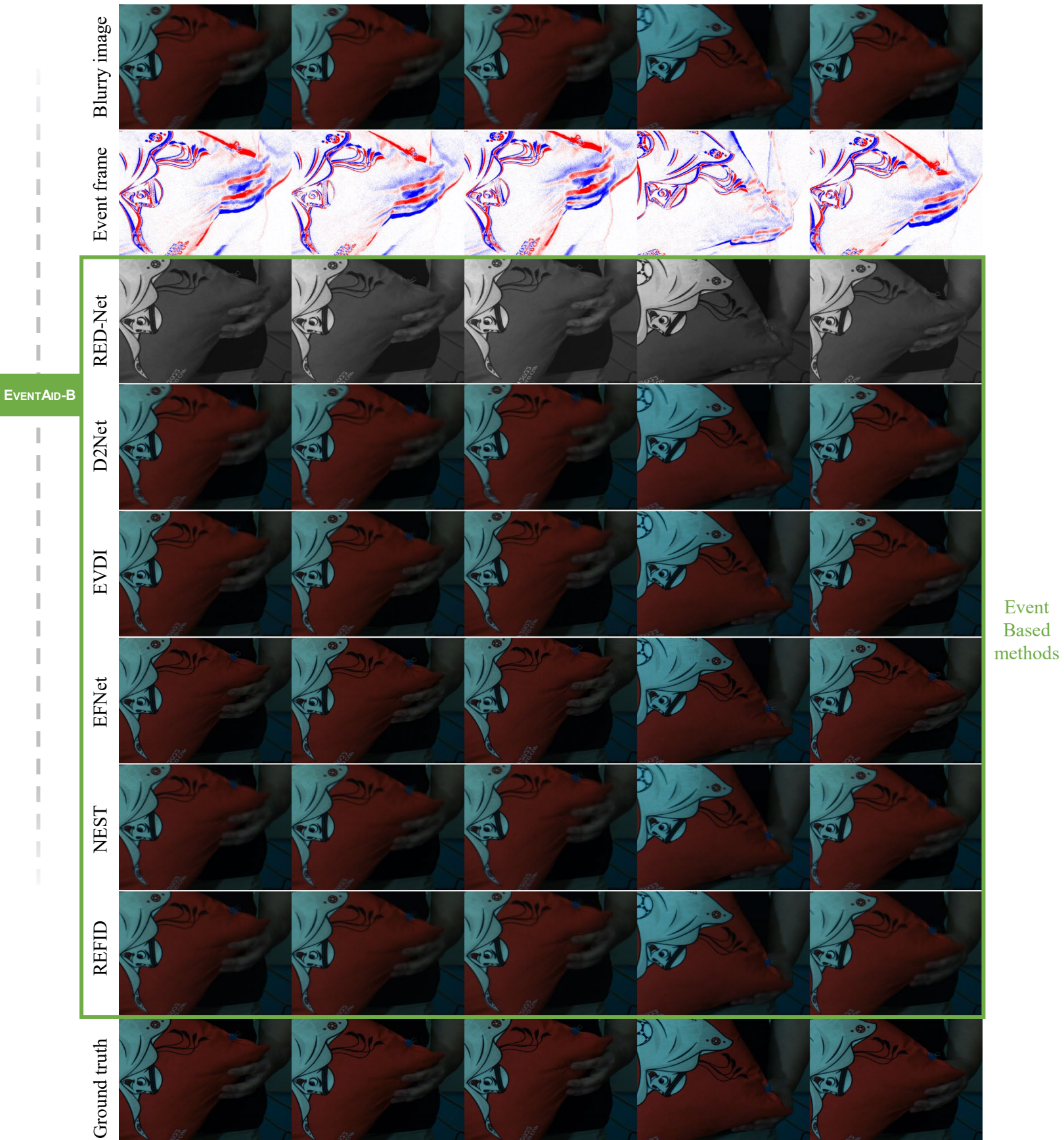


Figure S3-9: Comparison results of real-captured EVENTAID-B dataset (#9 B-PILLOW)
 (Compared with pretrained model)

EVENTAID-B

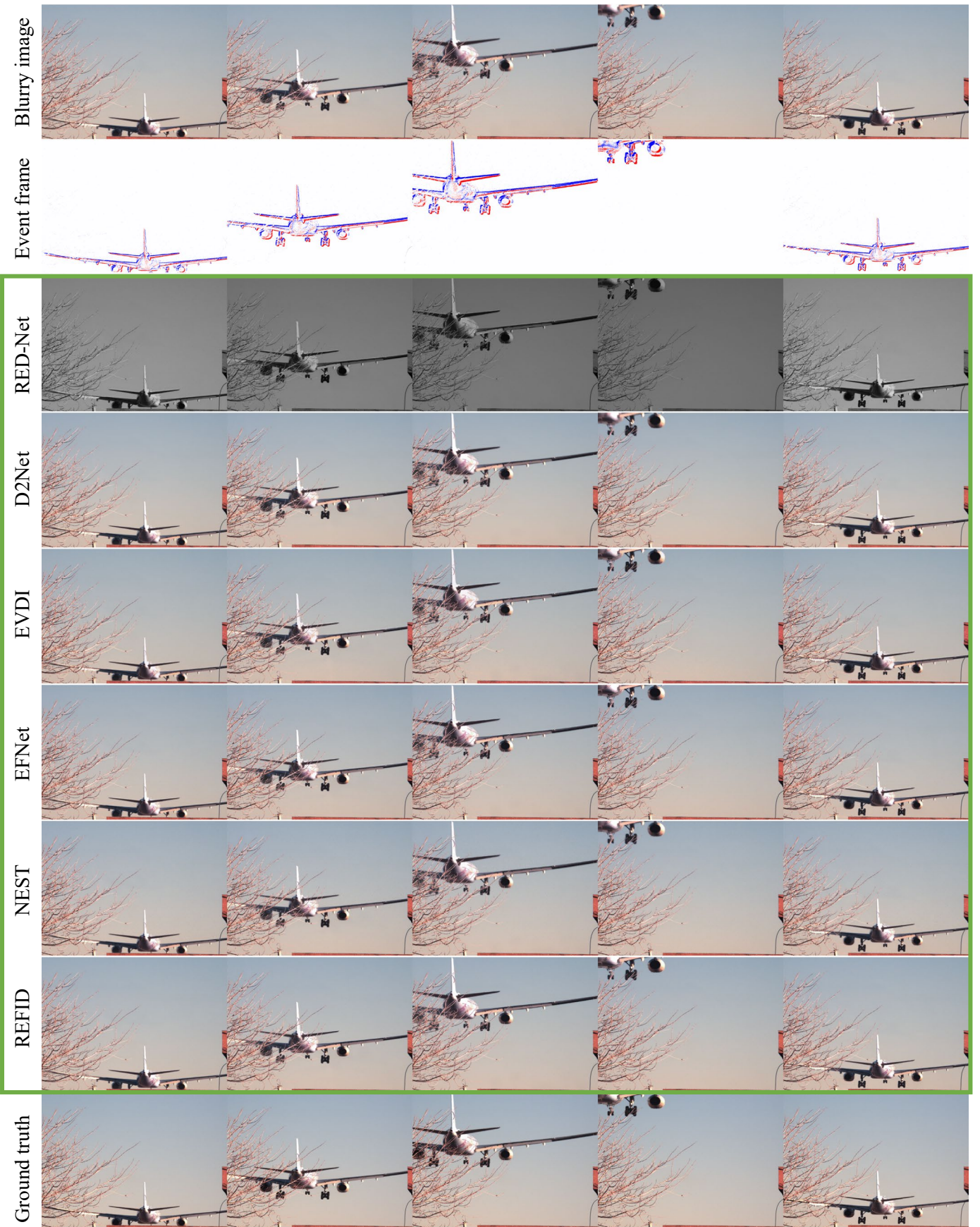


Figure S3-10: Comparison results of real-captured EVENTAID-B dataset (#10 B-PLANE)
(Compared with pretrained model)

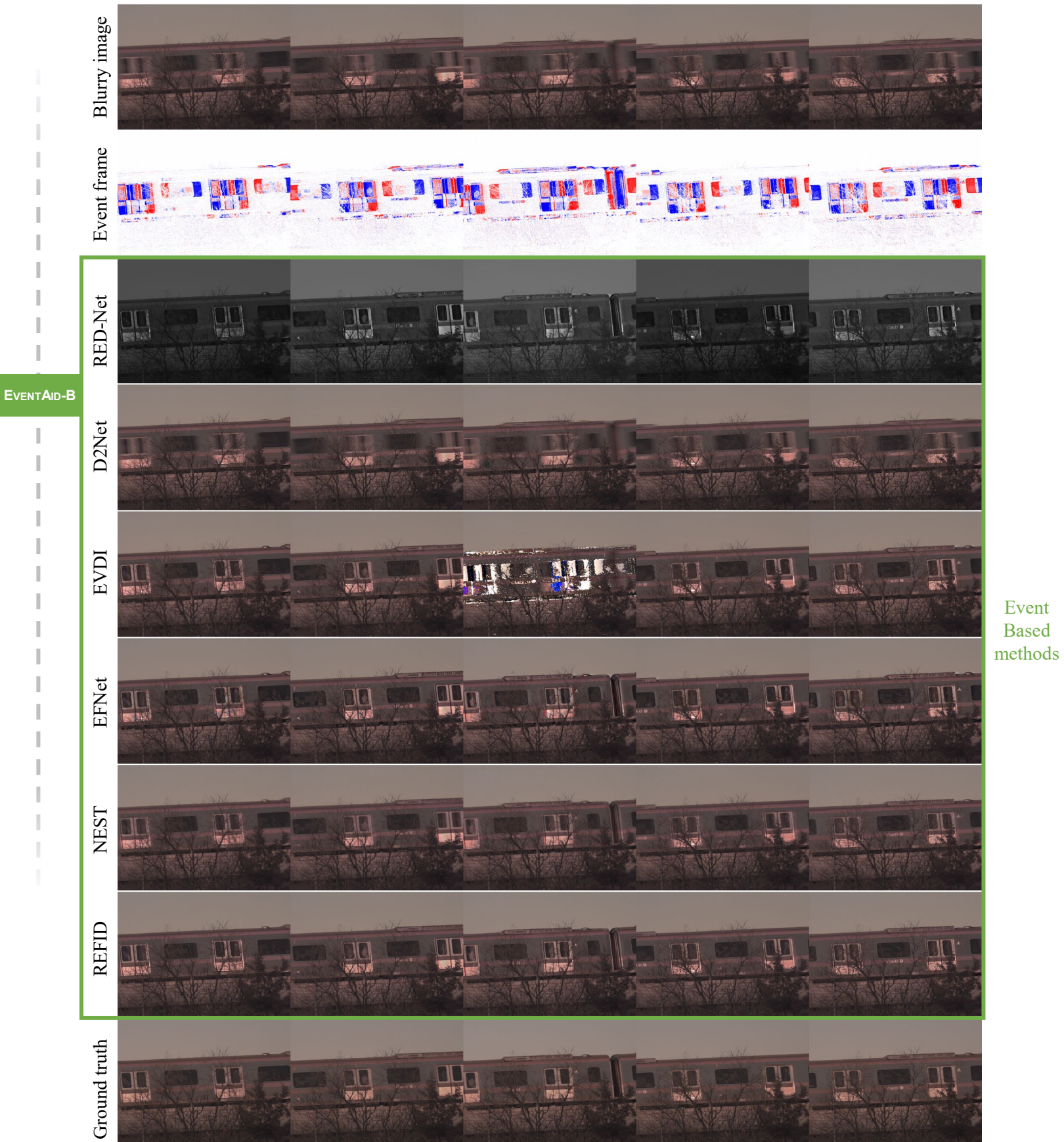


Figure S3-11: Comparison results of real-captured EVENTAID-B dataset (#11 B-SUBWAY)
(Compared with pretrained model)

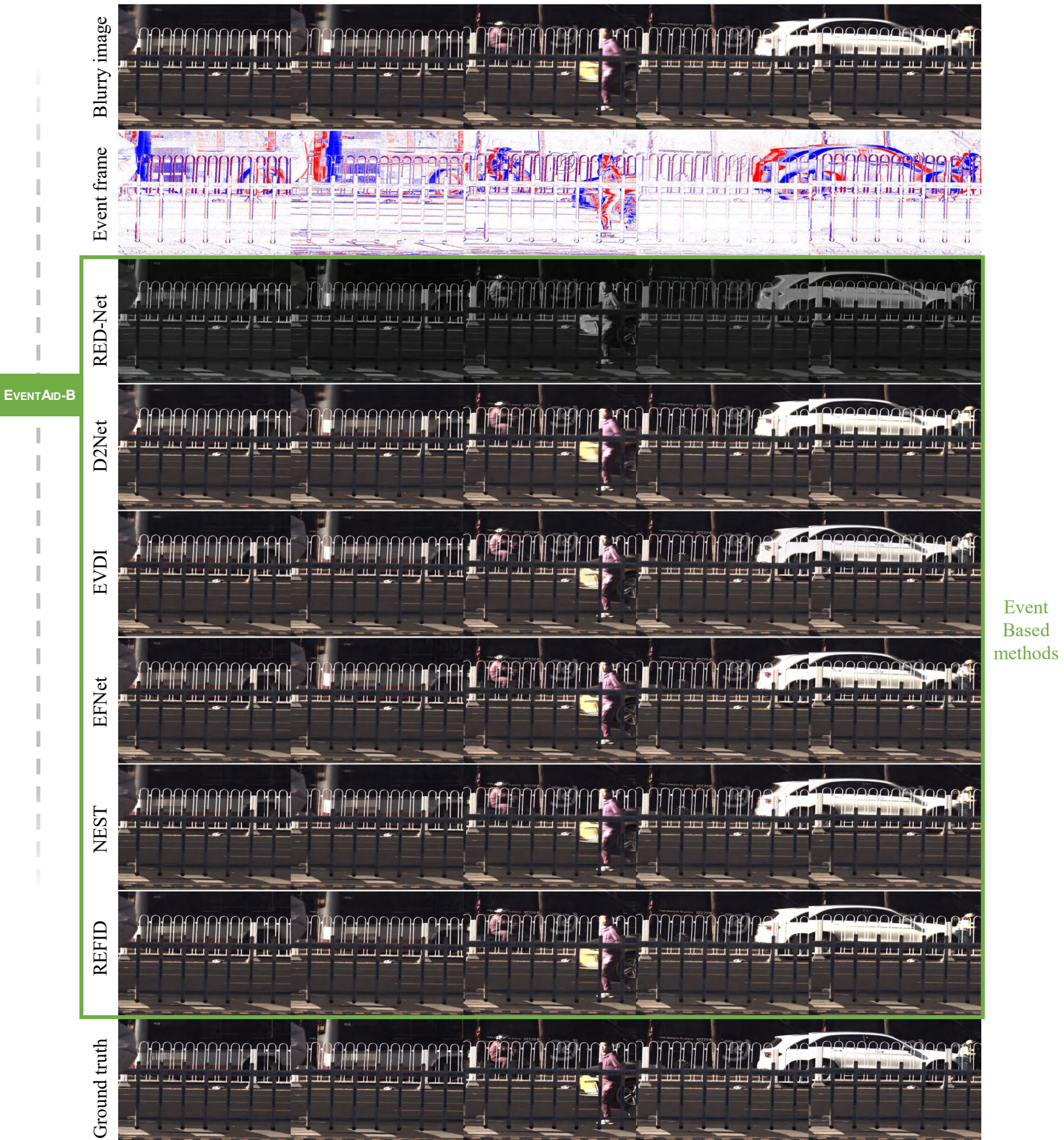


Figure S3-12: Comparison results of real-captured EVENTAID-B dataset (#12 B-TRAFFIC)
 (Compared with pretrained model)

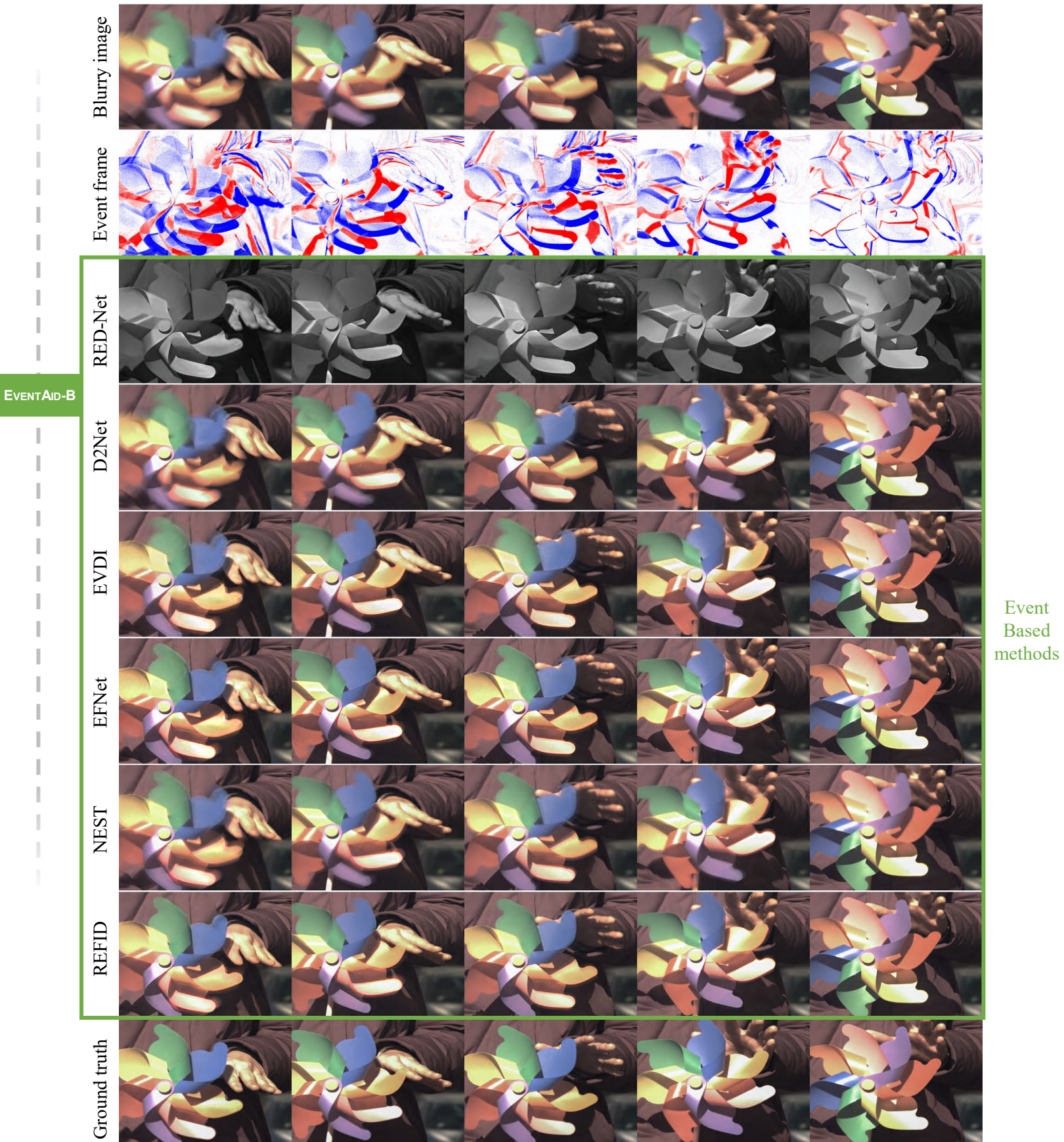
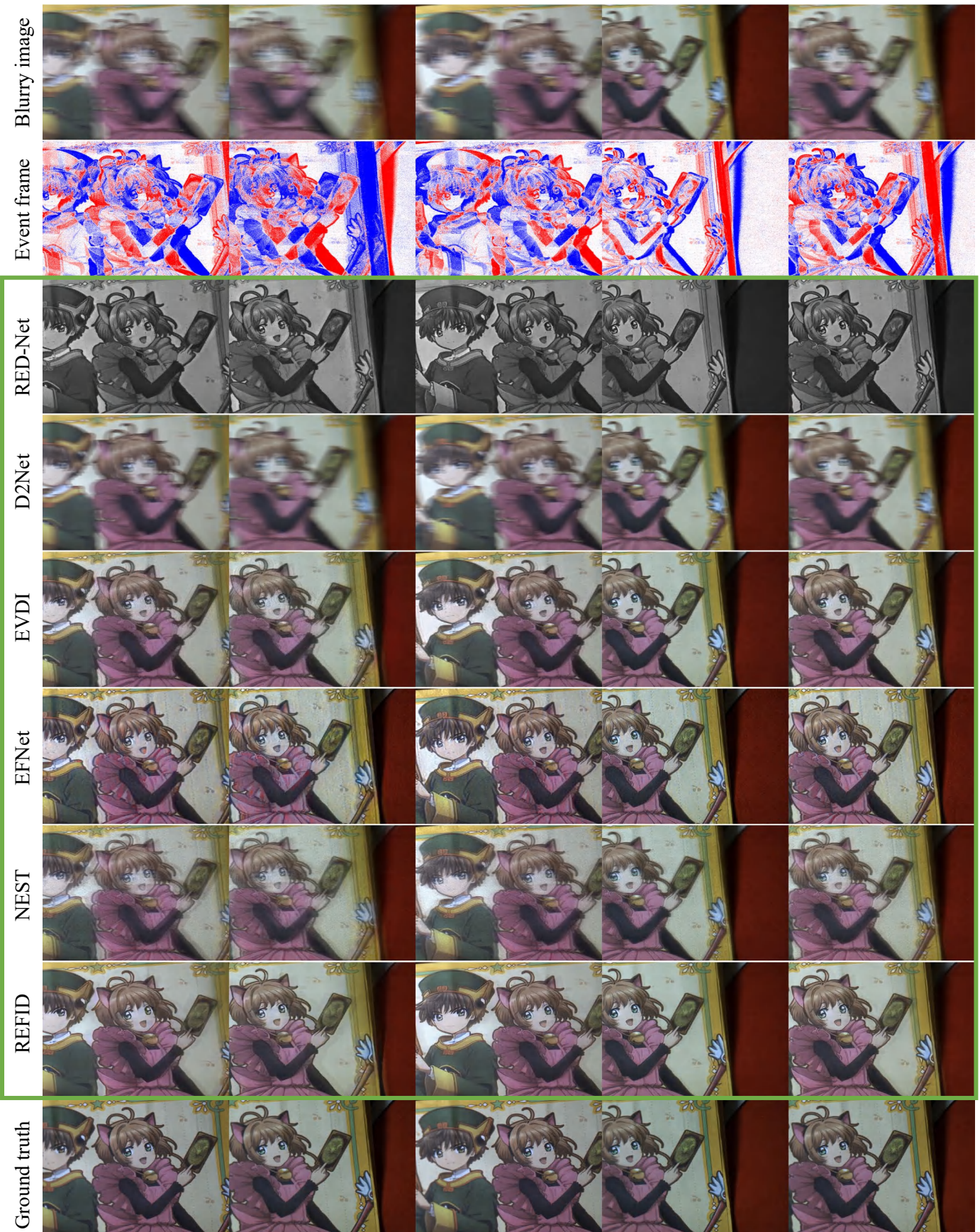


Figure S3-13: Comparison results of real-captured EVENTAID-B dataset (#13 B-WINDMILL) (Compared with pretrained model)

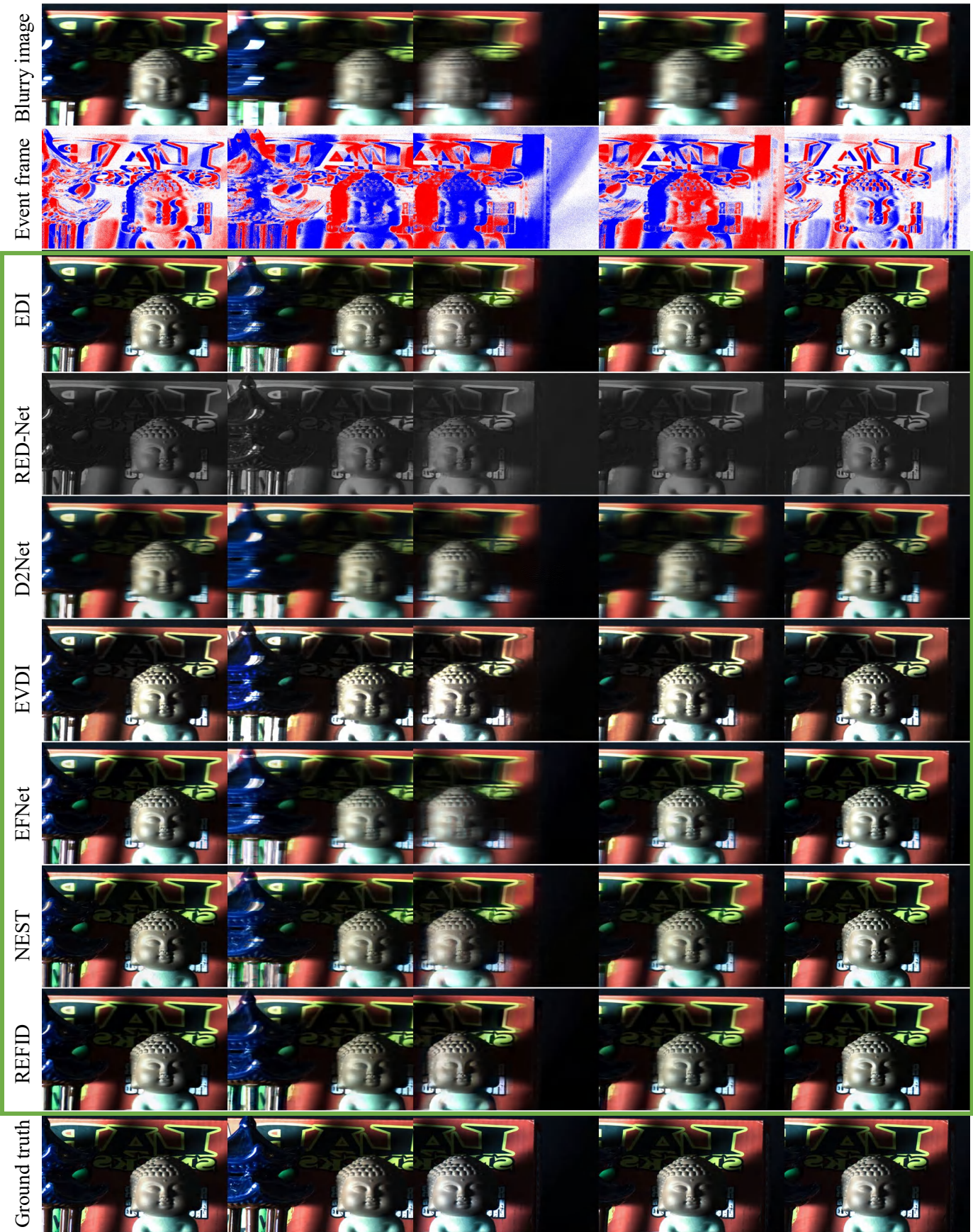
EVENTAID-B



Event Based methods

Figure S3-14: Comparison results of real-captured EVENTAID-B dataset (#14 B-XIAOYING) (Compared with pretrained model)

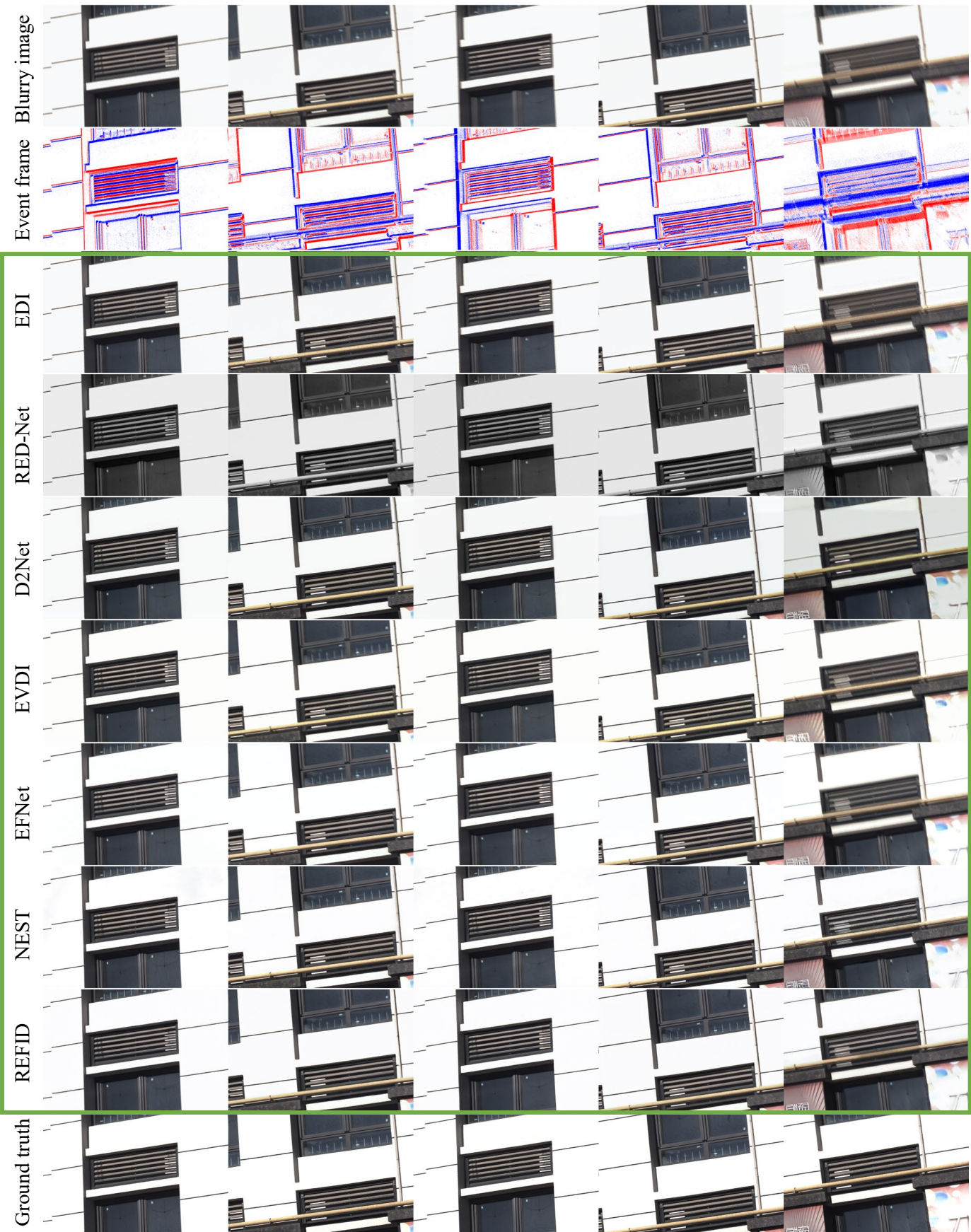
EVENTAID-B



Event Based methods

Figure S3-15: Comparison results of real-captured EVENTAID-B dataset (#1 B-BOX) (Compared with finetuned model)

EVENTAID-B



Event Based methods

Figure S3-16: Comparison results of real-captured EVENTAID-B dataset (#2 B-BUILDING) (Compared with finetuned model)



Figure S3-17: Comparison results of real-captured EVENTAID-B dataset (#3 B-DANCE)
(Compared with finetuned model)

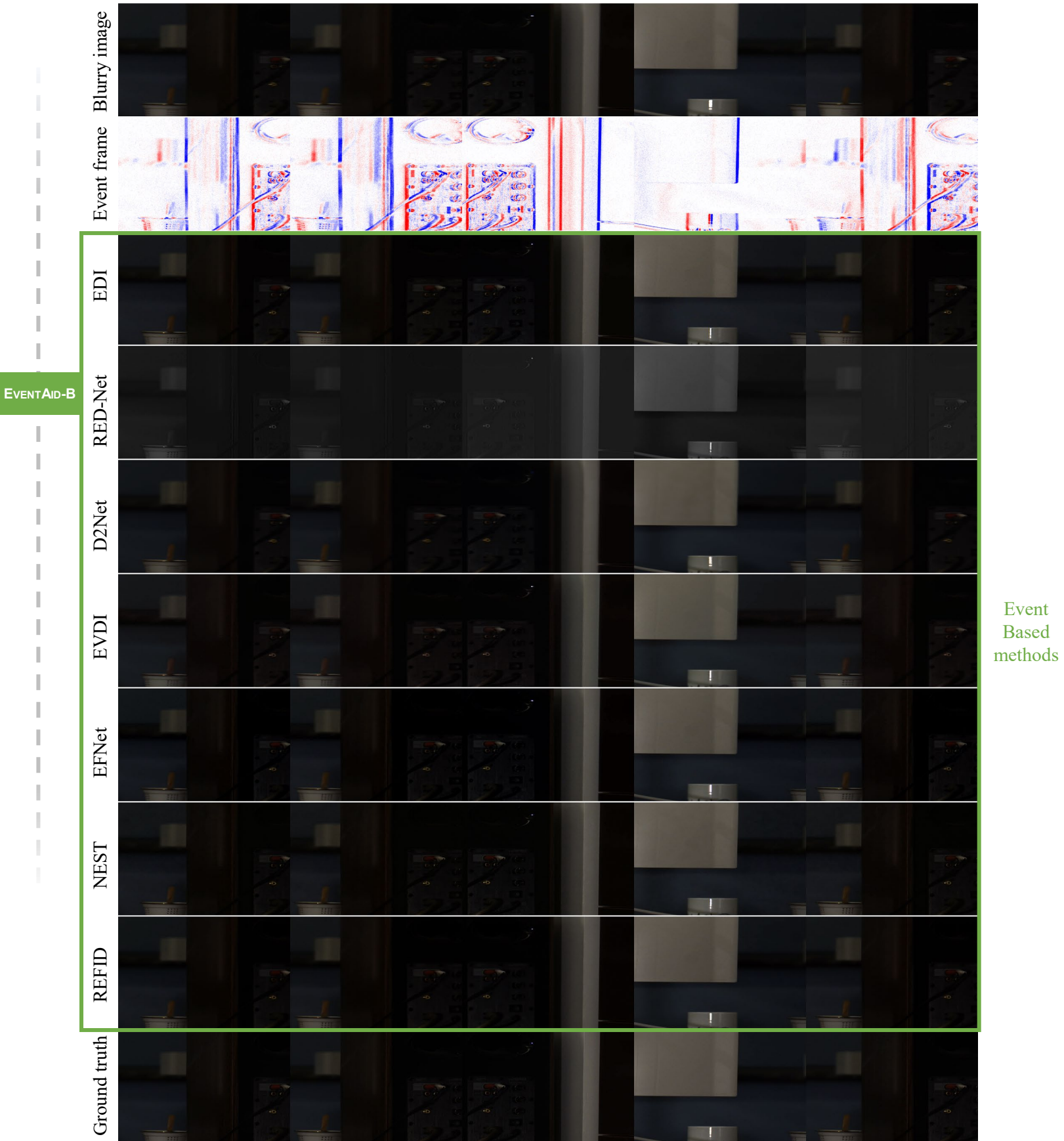


Figure S3-18: Comparison results of real-captured EVENTAID-B dataset (#4 B-DESK) (Compared with finetuned model)

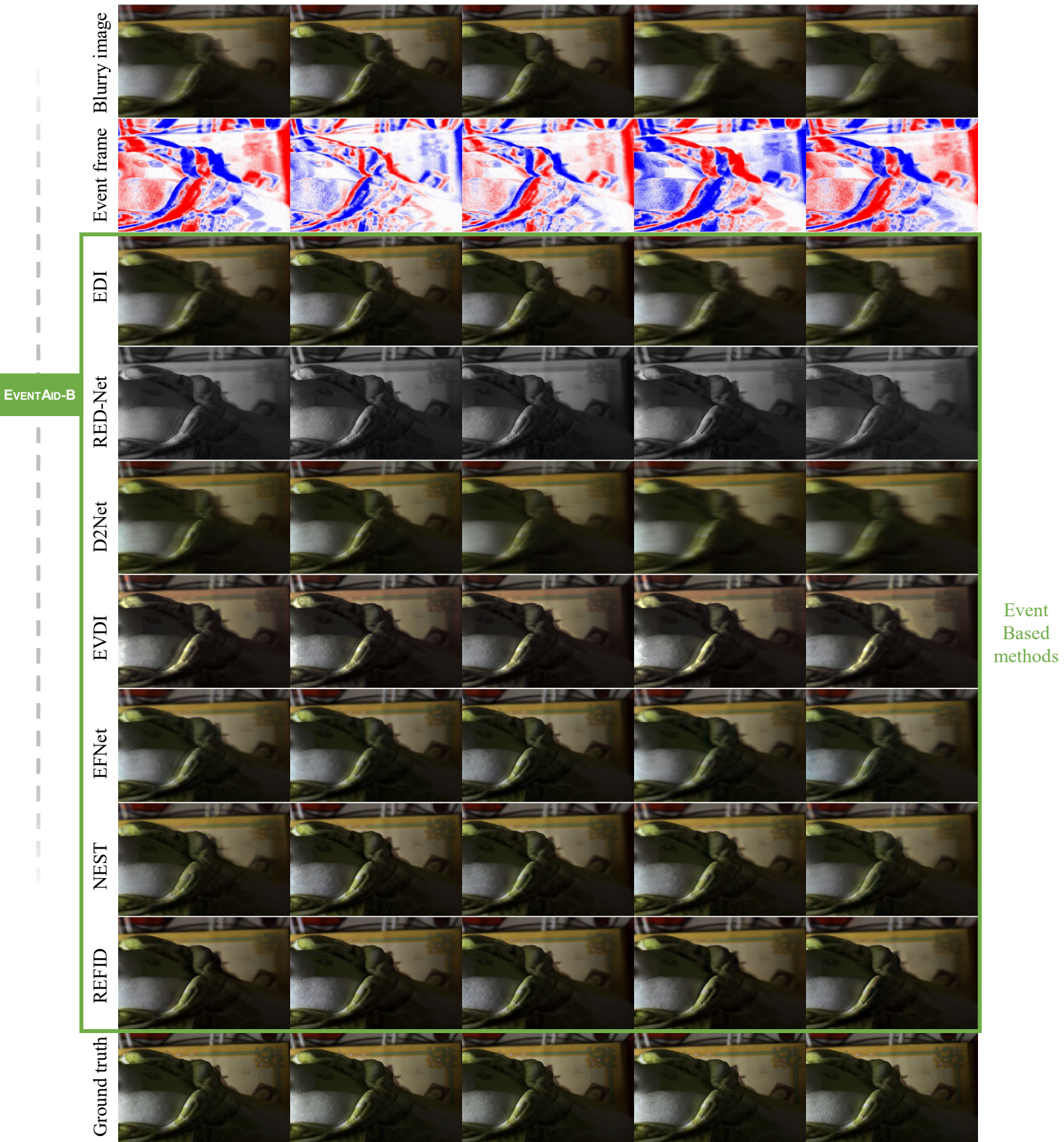
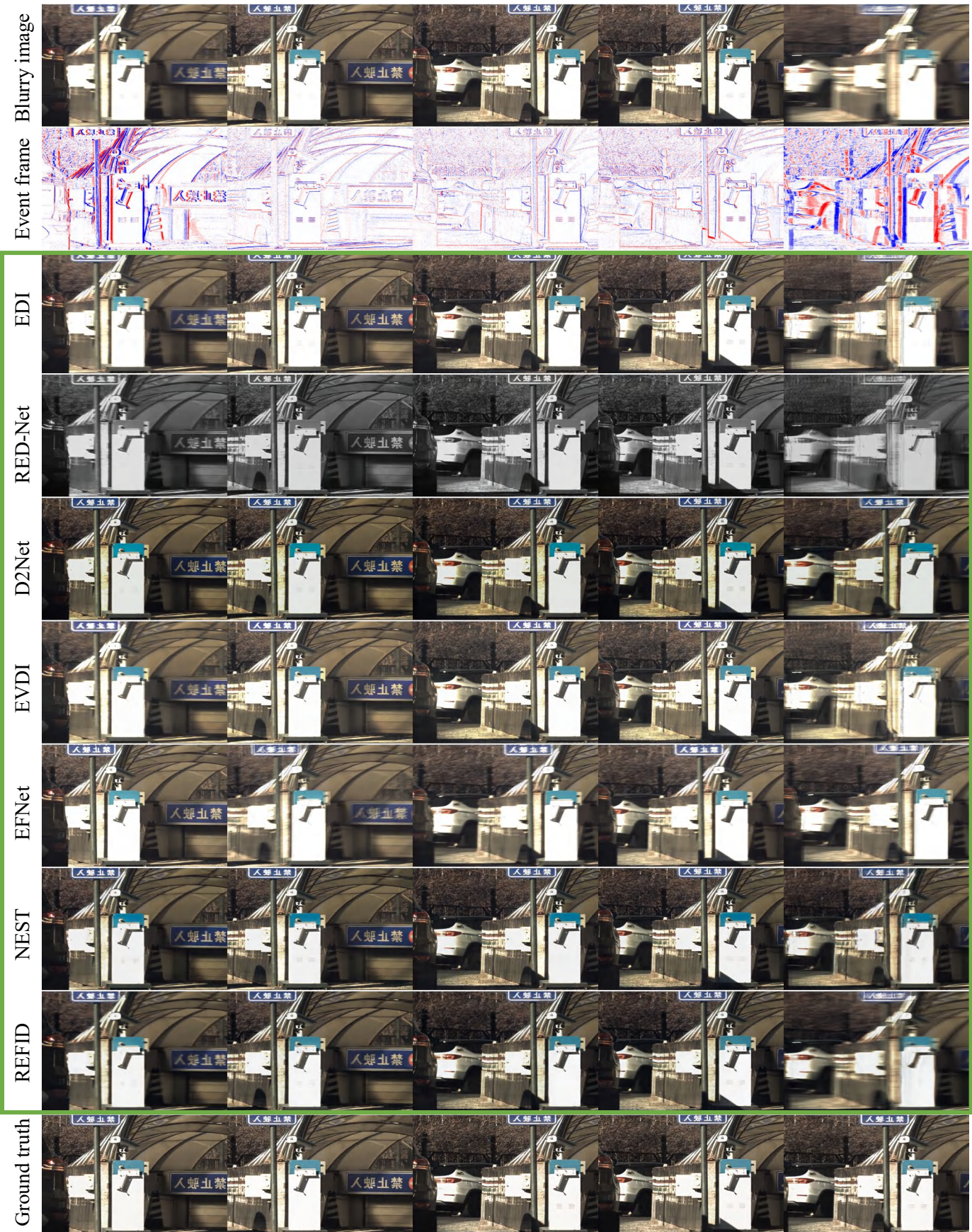


Figure S3-19: Comparison results of real-captured EVENTAID-B dataset (#5 B-DOG) (Compared with finetuned model)



Event Based methods

Figure S3-20: Comparison results of real-captured EVENTAID-B dataset (#6 B-ENTRANCE) (Compared with finetuned model)

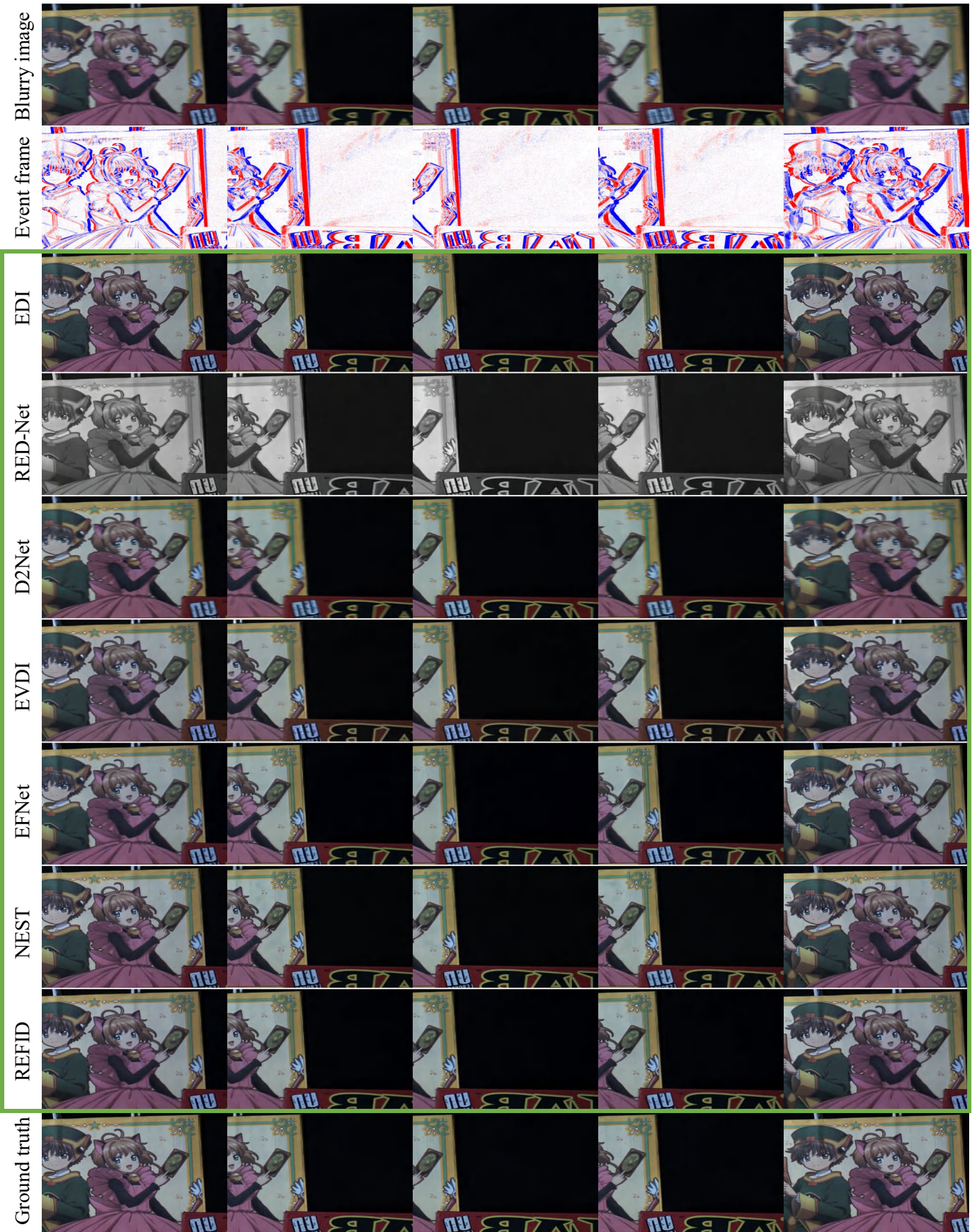


Figure S3-21: Comparison results of real-captured EVENTAID-B dataset (#7 B-GLOBAL)
(Compared with finetuned model)

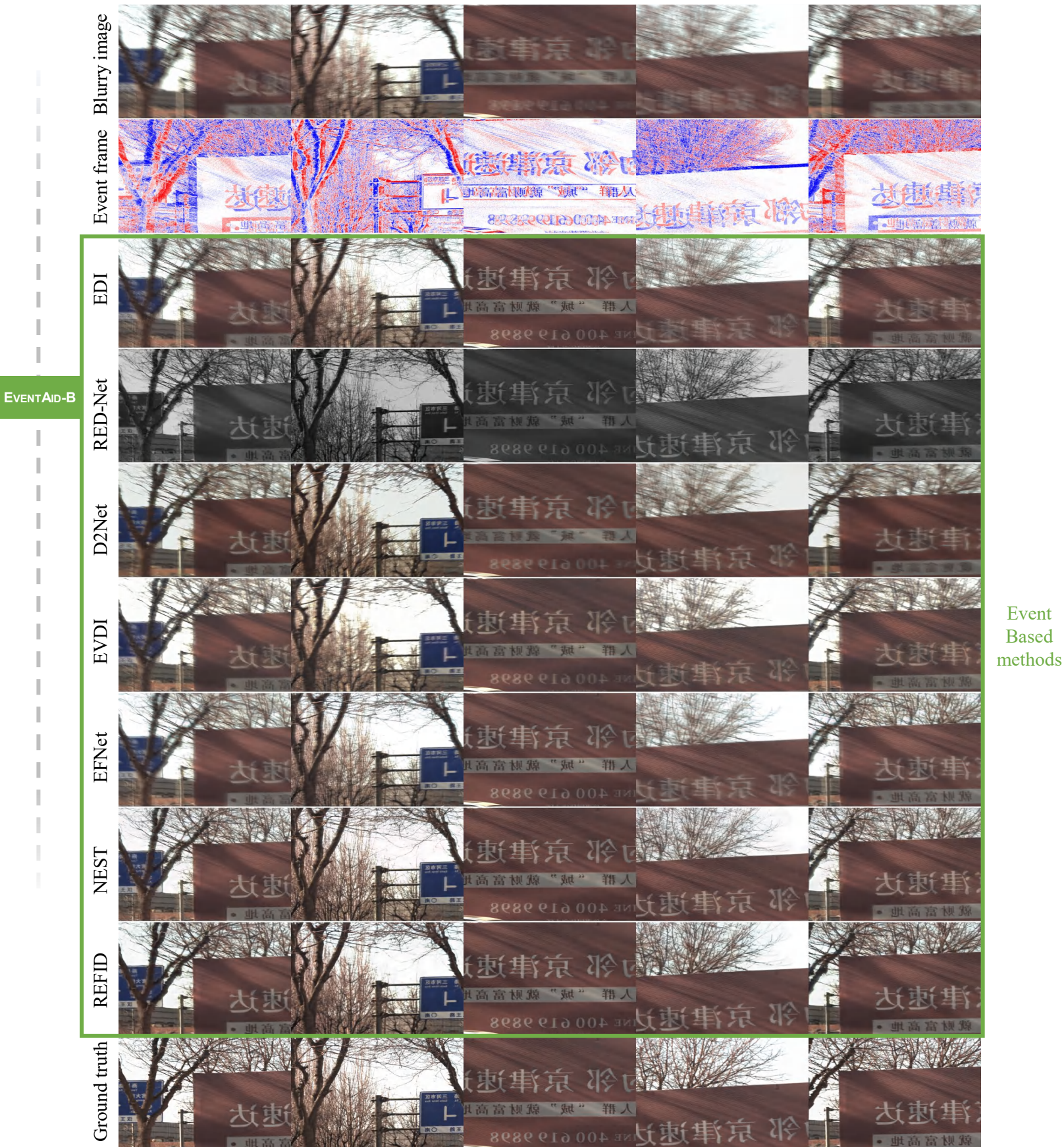


Figure S3-22: Comparison results of real-captured EVENTAID-B dataset (#8 B-JINGJIN)
(Compared with finetuned model)

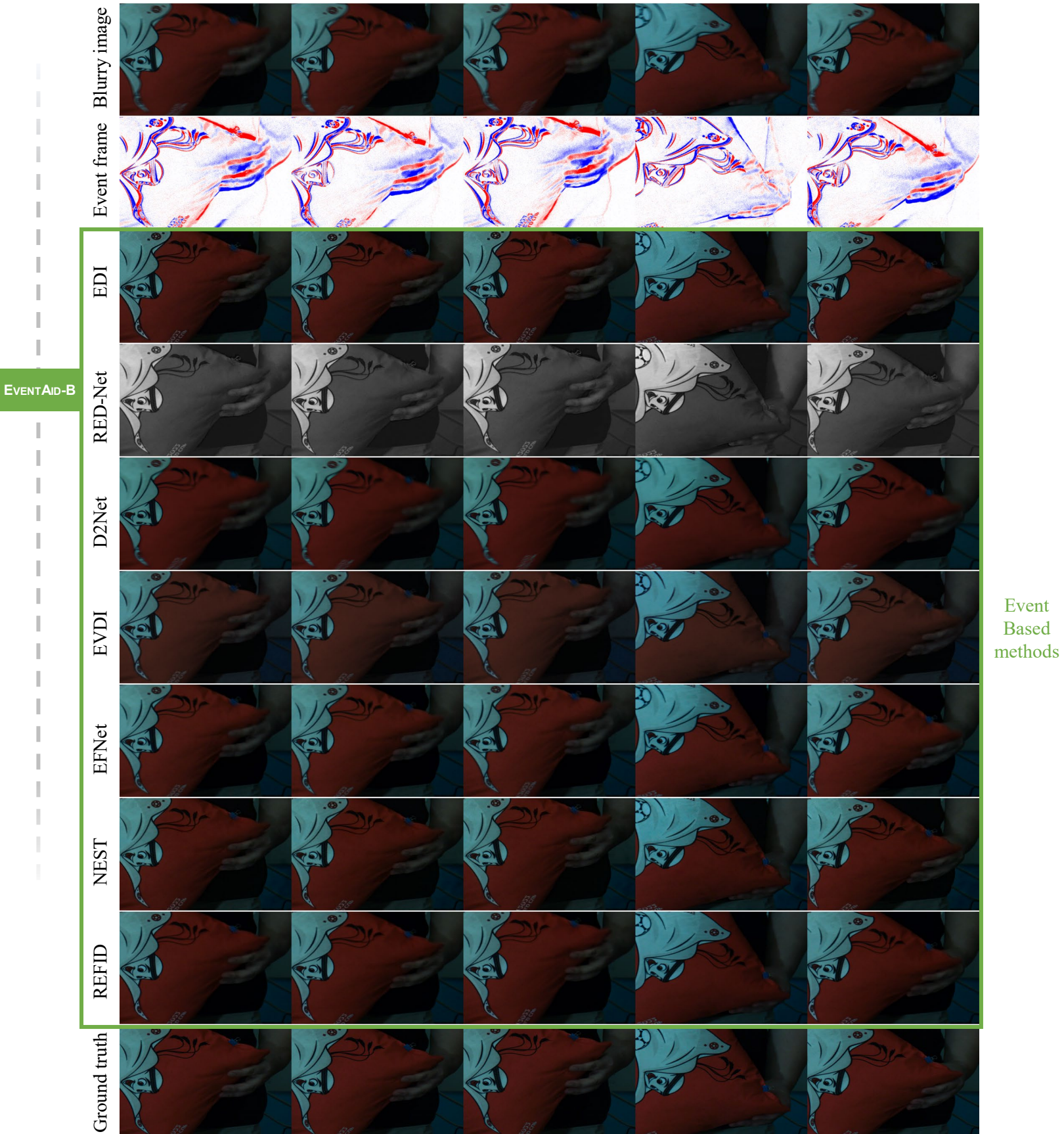


Figure S3-23: Comparison results of real-captured EVENTAID-B dataset (#9 B-PILLOW) (Compared with finetuned model)

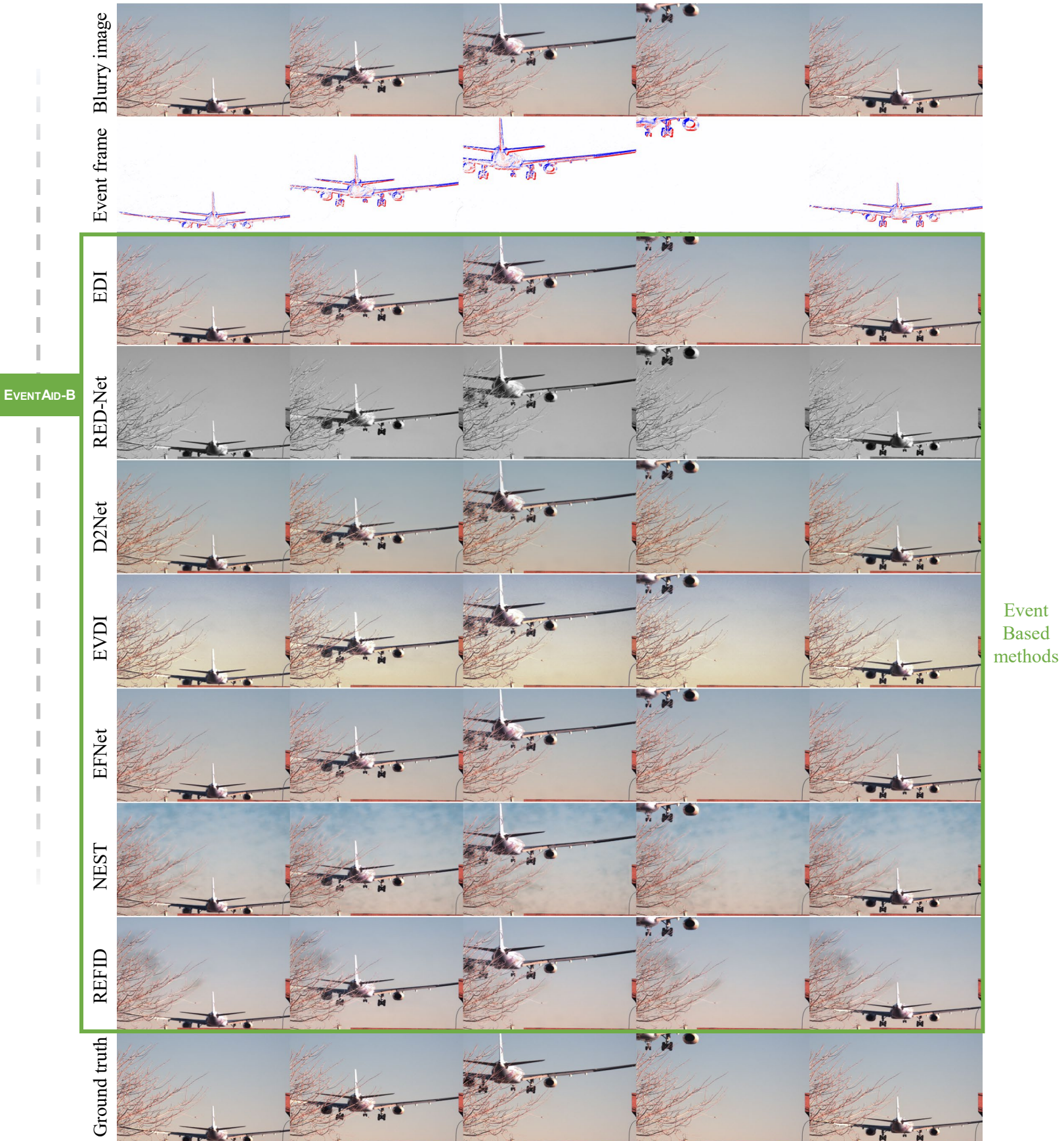


Figure S3-24: Comparison results of real-captured EVENTAID-B dataset (#10 B-PLANE)
(Compared with finetuned model)

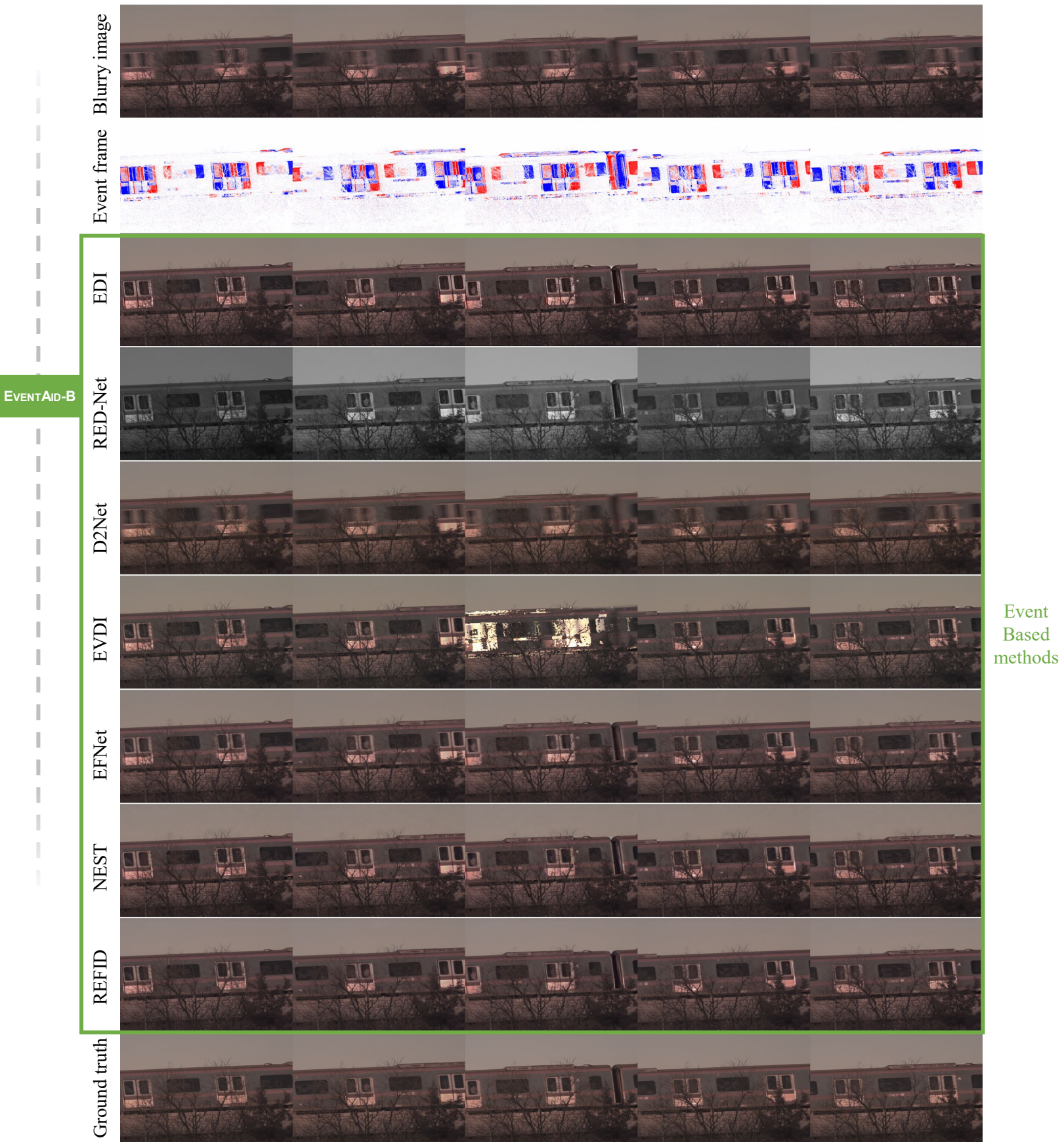


Figure S3-25: Comparison results of real-captured EVENTAID-B dataset (#11 B-SUBWAY)
(Compared with finetuned model)

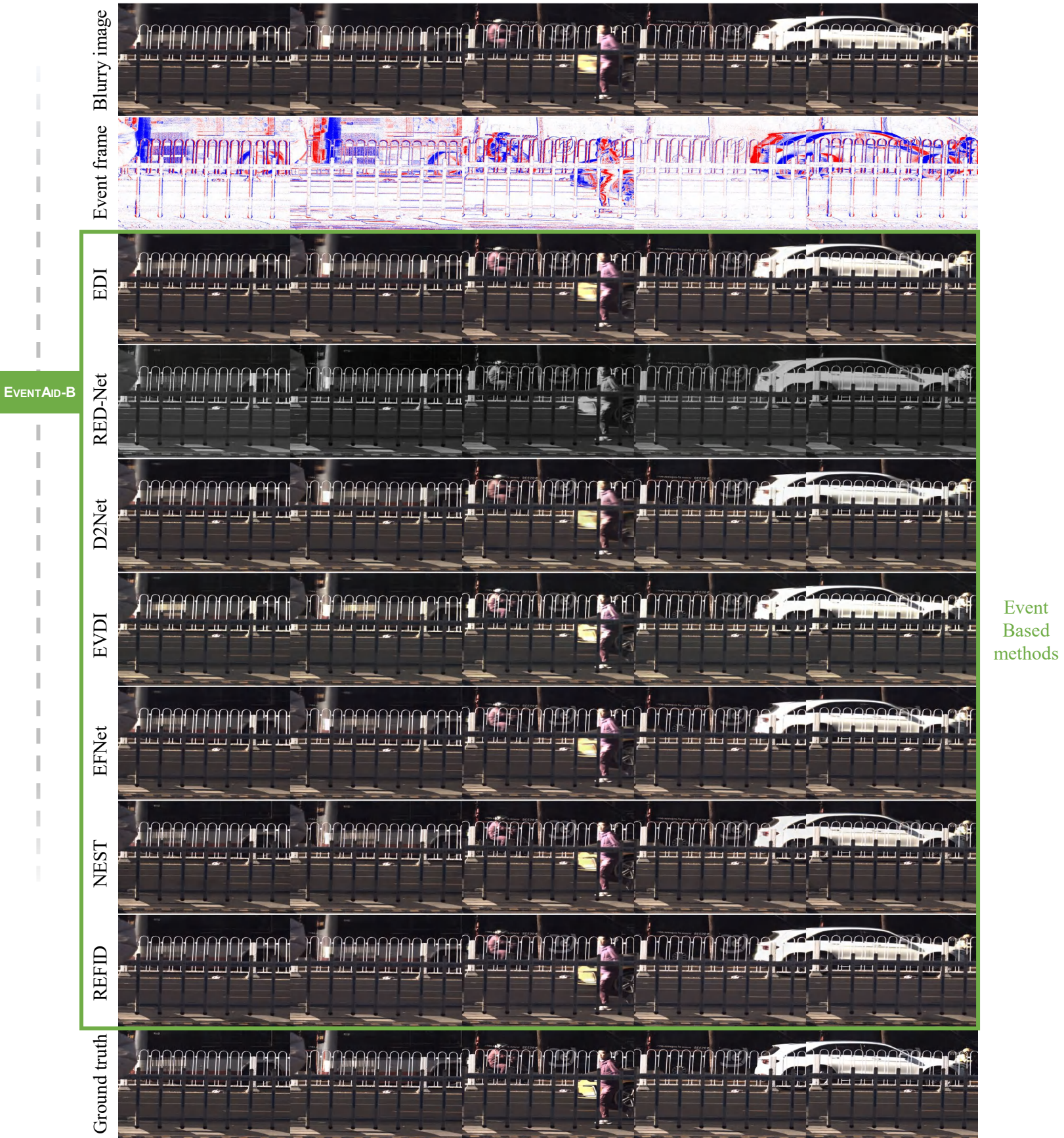


Figure S3-26: Comparison results of real-captured EVENTAID-B dataset (#12 B-TRAFFIC) (Compared with finetuned model)

EVENTAID-B

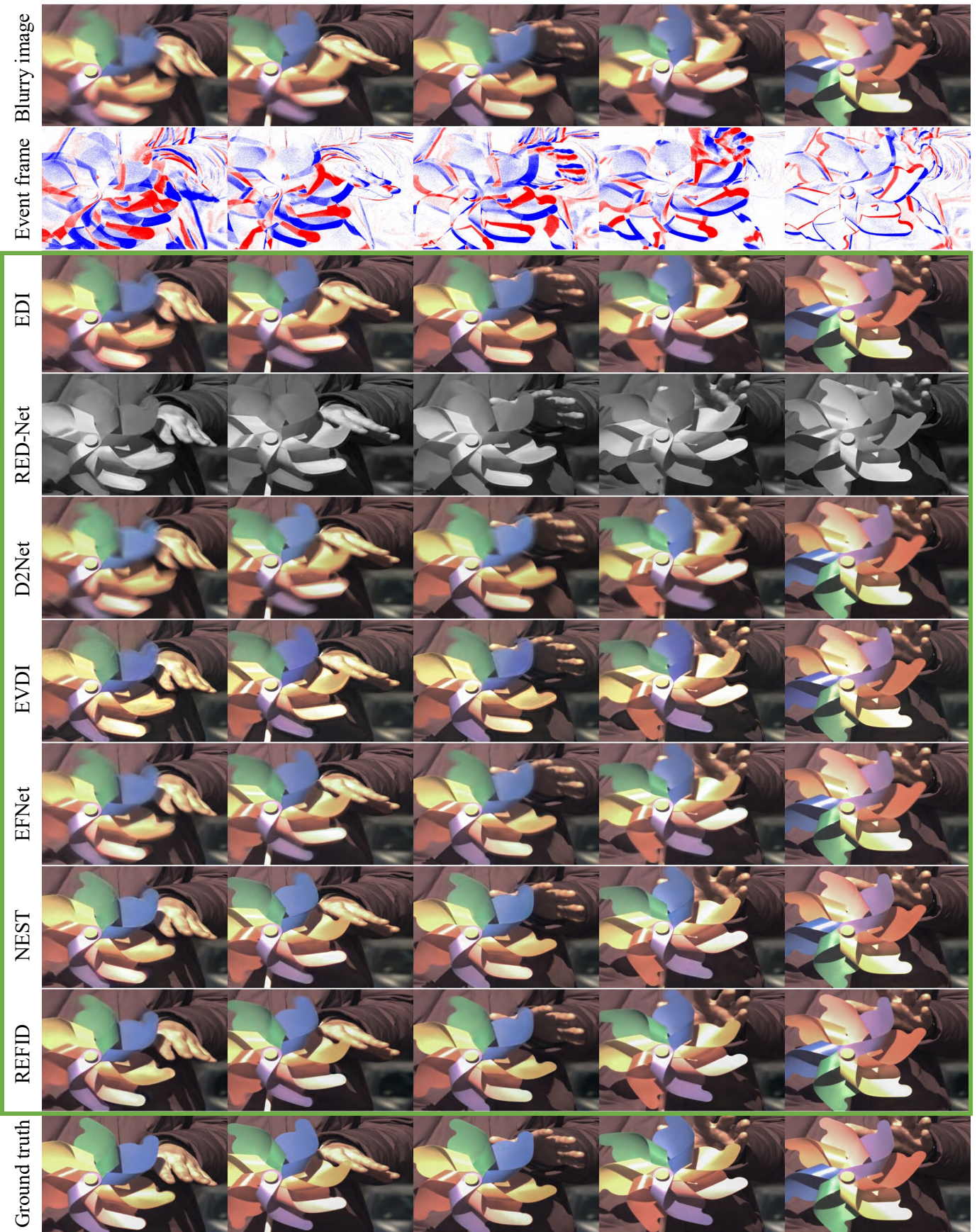
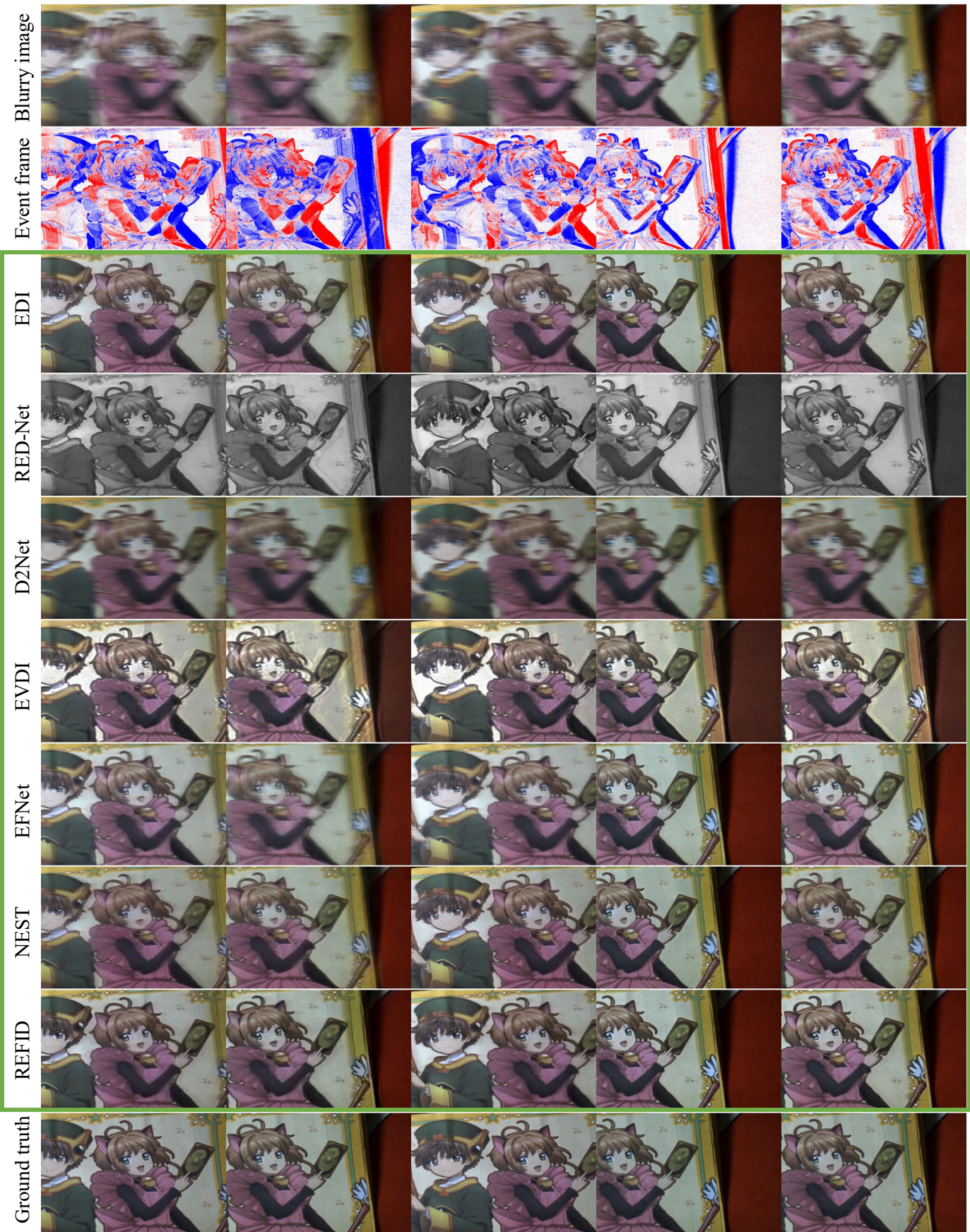


Figure S3-27: Comparison results of real-captured EVENTAID-B dataset (#13 B-WINDMILL) (Compared with finetuned model)

Event Based methods

EVENTAID-B



Event Based methods

Figure S3-28: Comparison results of real-captured EVENTAID-B dataset (#14 B-XIAOYING) (Compared with finetuned model)

EVENTAID-B

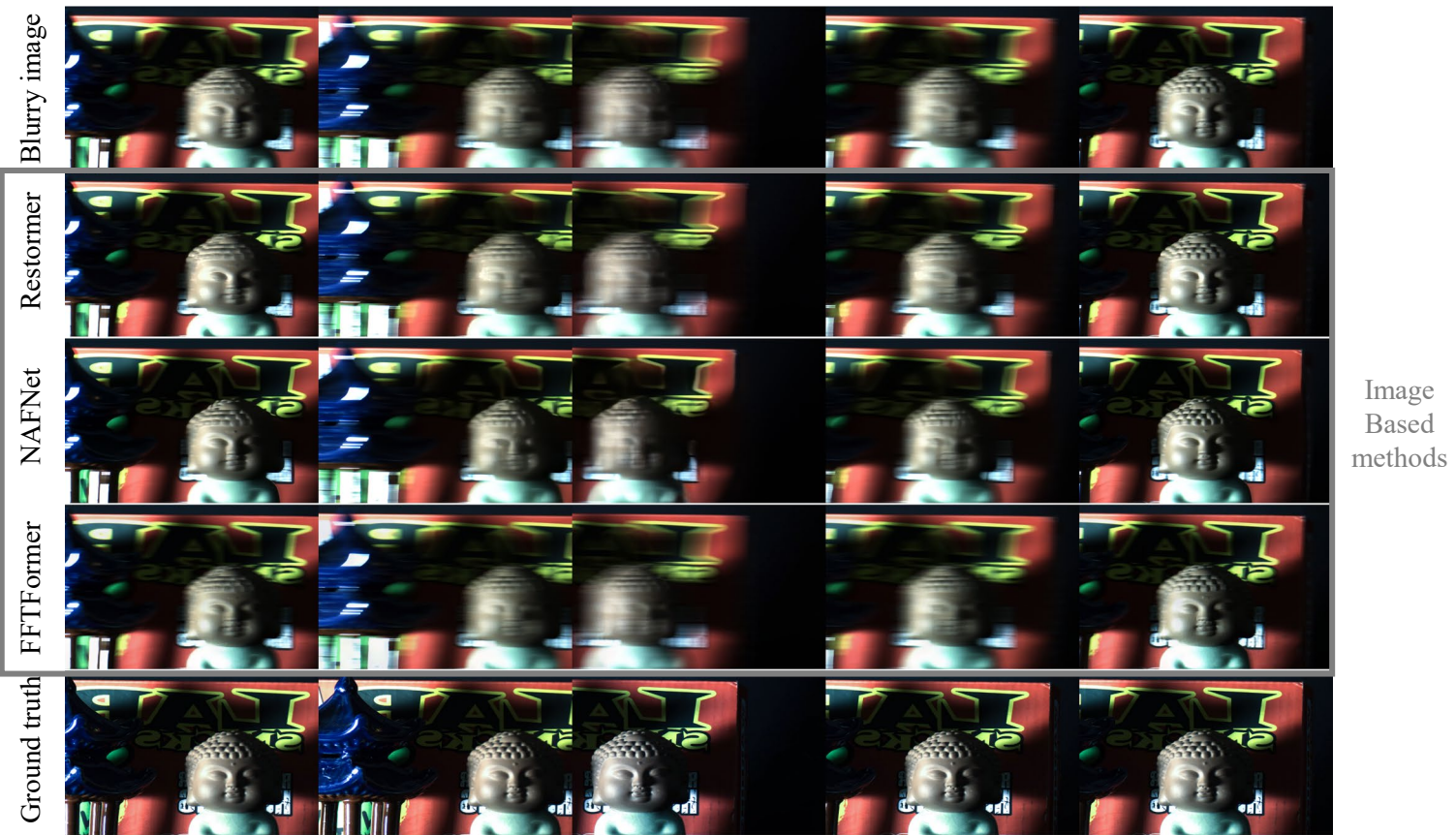


Figure S3-29: Comparison results of real-captured EVENTAID-B dataset (#1 B-BOX)

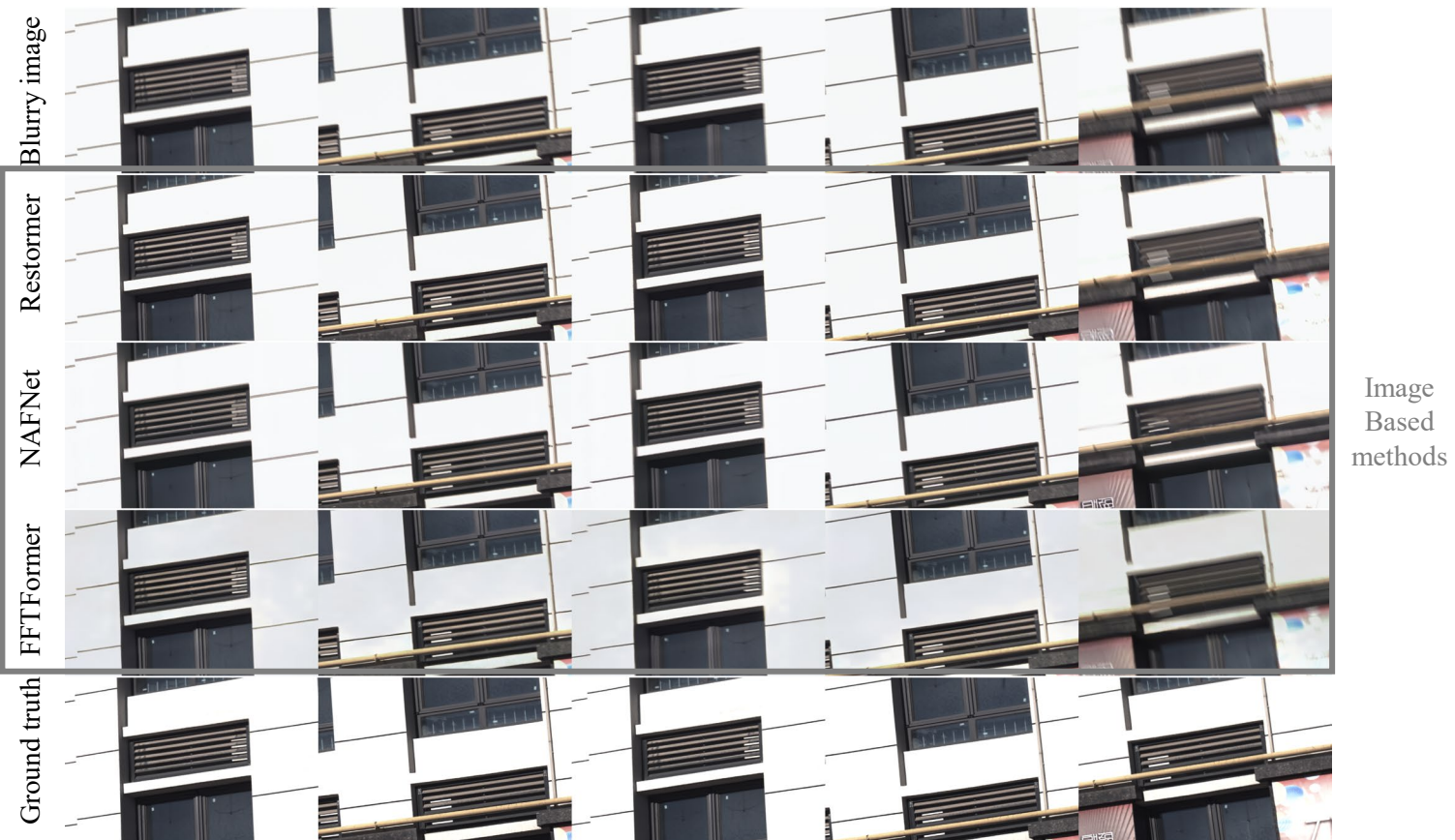


Figure S3-30: Comparison results of real-captured EVENTAID-B dataset (#2 B-BUILDING)

EVENTAID-B



Figure S3-31: Comparison results of real-captured EVENTAID-B dataset (#3 B-DANCE)



Figure S3-32: Comparison results of real-captured EVENTAID-B dataset (#4 B-DESK)

EVENTAID-B



Image Based methods

Figure S3-33: Comparison results of real-captured EVENTAID-B dataset (#5 B-DOG)

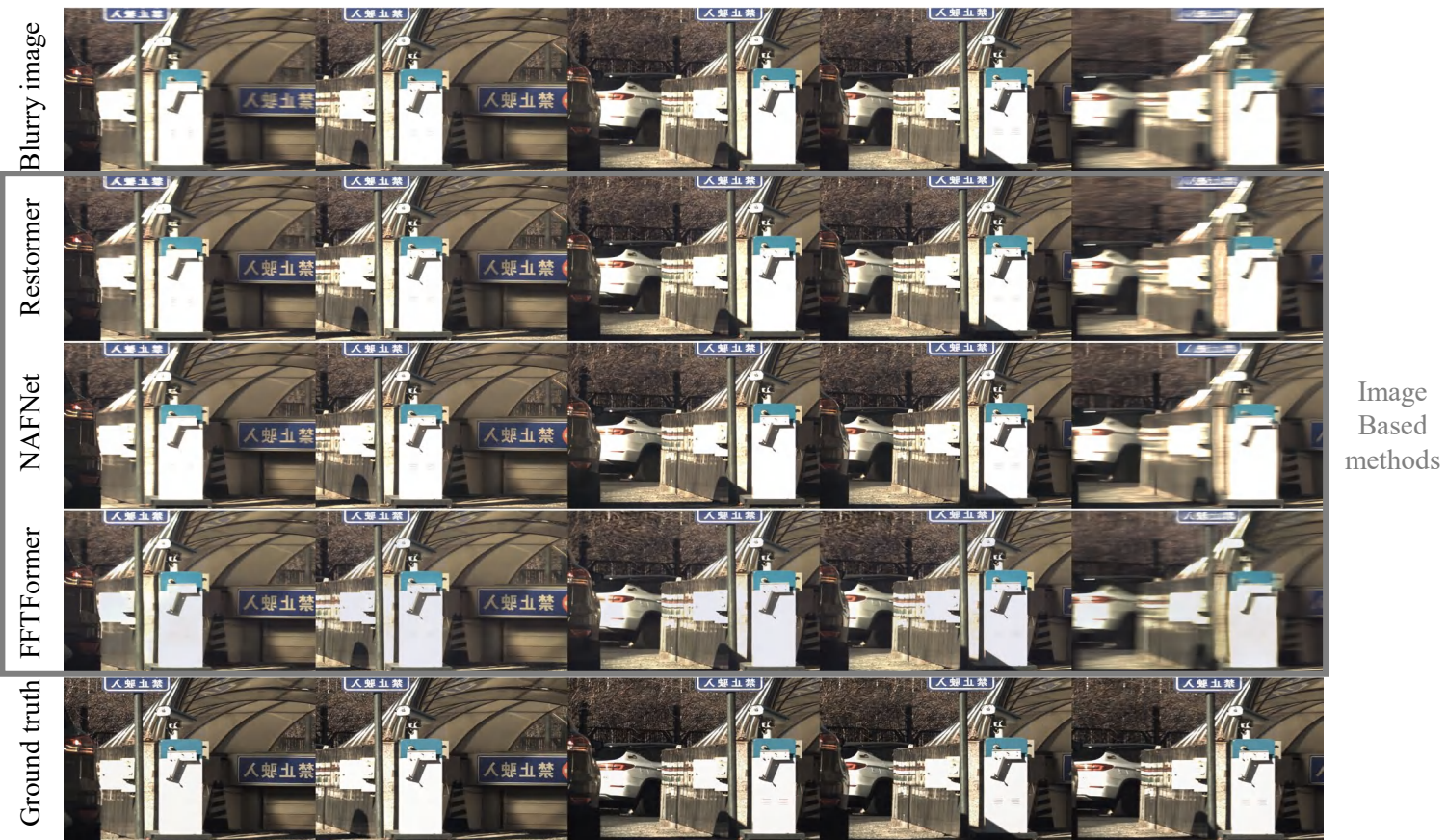


Image Based methods

Figure S3-34: Comparison results of real-captured EVENTAID-B dataset (#6 B-ENTRANCE)

EVENTAID-B

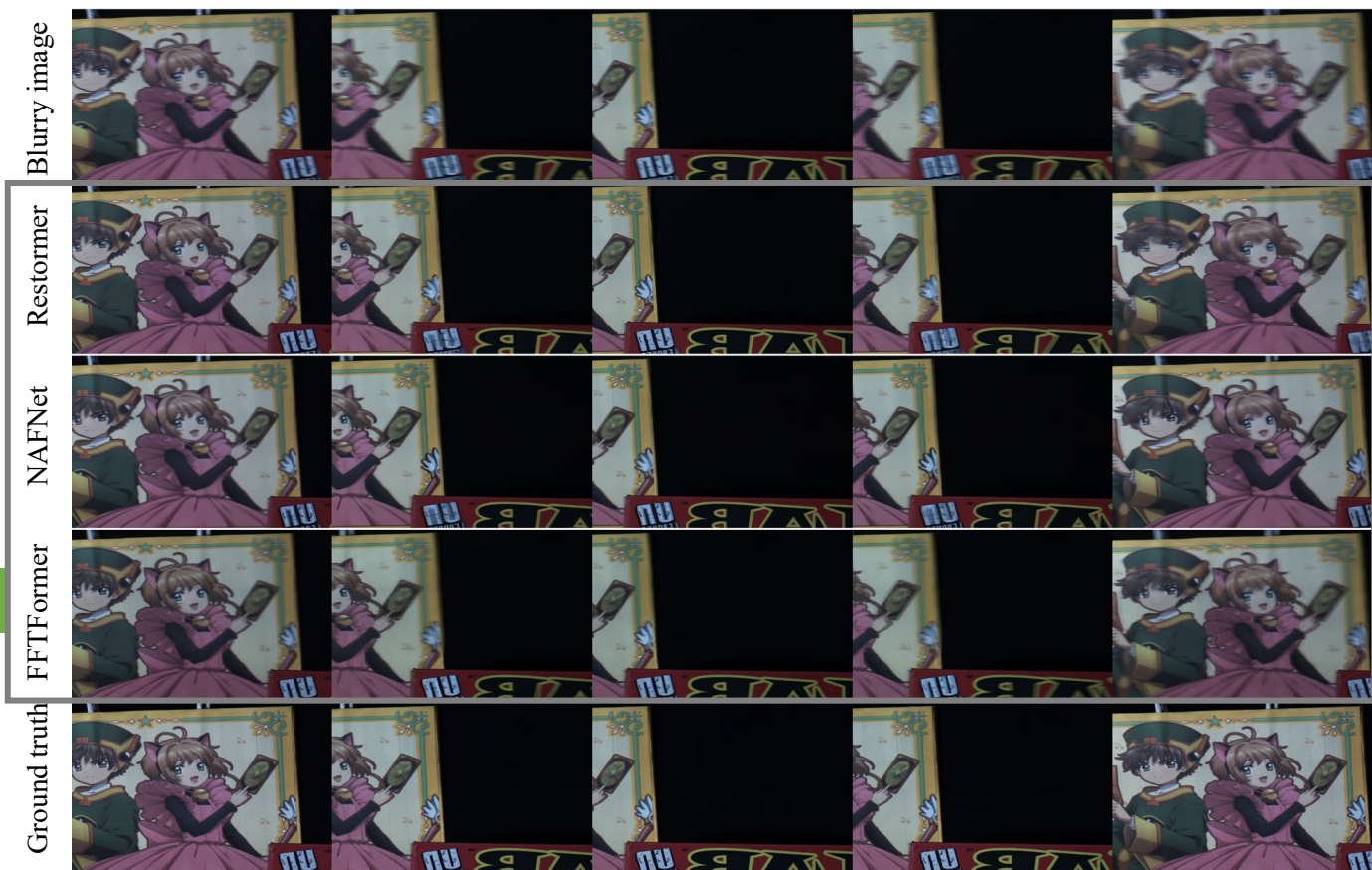


Image Based methods

Figure S3-35: Comparison results of real-captured EVENTAID-B dataset (#7 B-GLOBAL)



Image Based methods

Figure S3-36: Comparison results of real-captured EVENTAID-B dataset (#8 B-JINGJIN)

EVENTAID-B



Figure S3-37: Comparison results of real-captured EVENTAID-B dataset (#9 B-PILLOW)



Figure S3-38: Comparison results of real-captured EVENTAID-B dataset (#10 B-PLANE)

EVENTAID-B

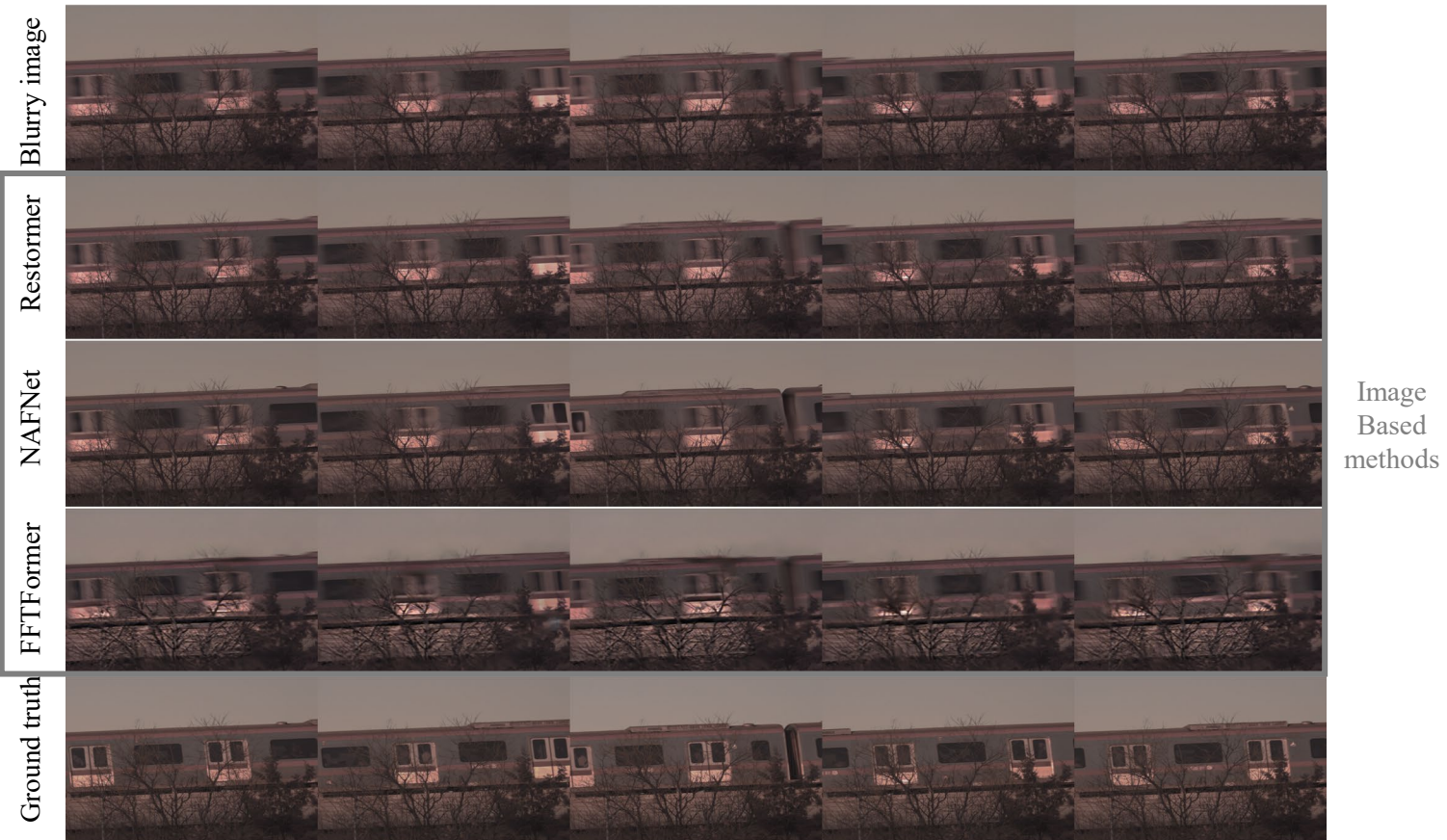


Figure S3-39: Comparison results of real-captured EVENTAID-B dataset (#11 B-SUBWAY)

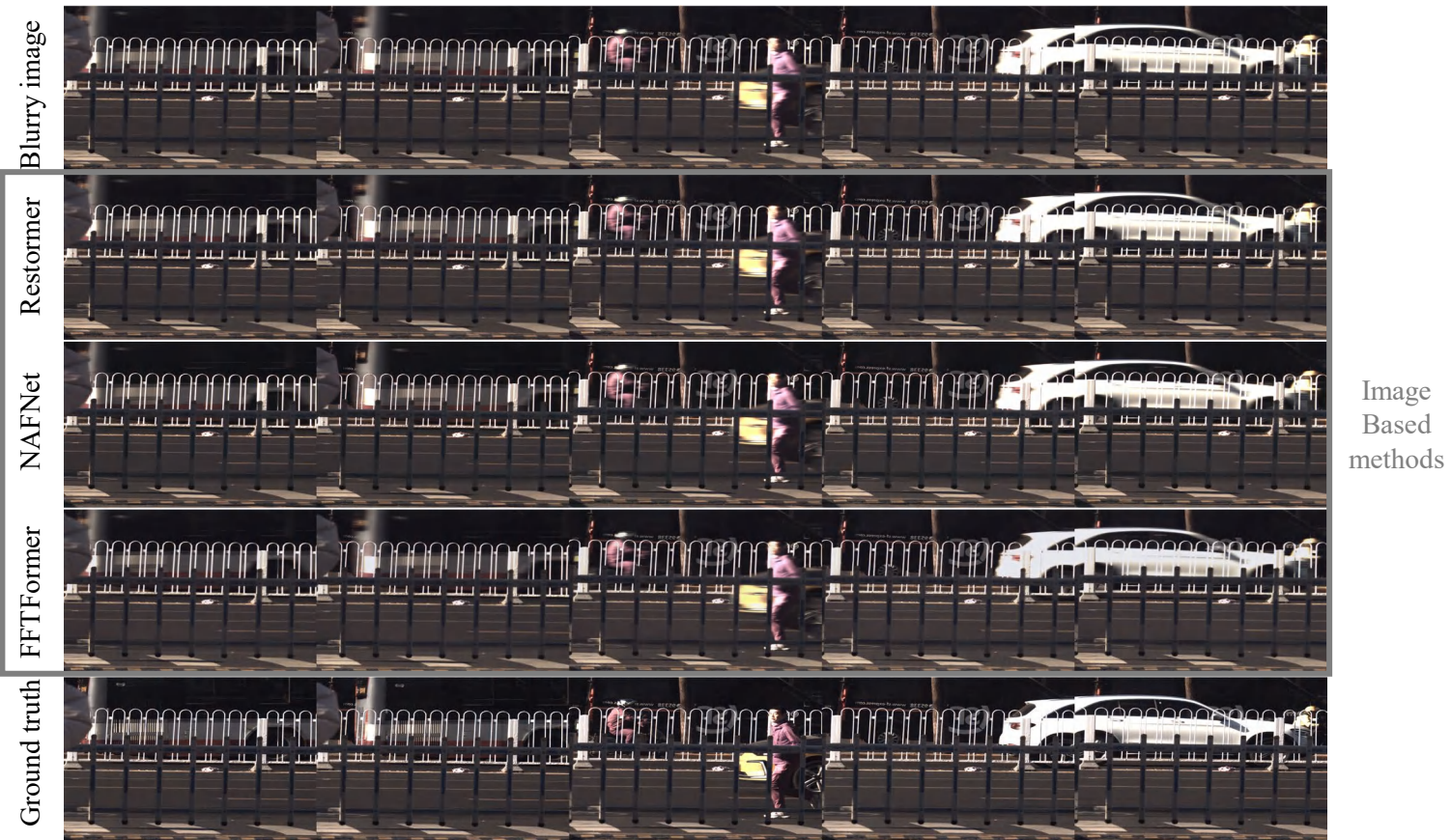


Figure S3-40: Comparison results of real-captured EVENTAID-B dataset (#12 B-TRAFFIC)

EVENTAID-B



Image Based methods

Figure S3-41: Comparison results of real-captured EVENTAID-B dataset (#13 B-WINDMILL)



Image Based methods

Figure S3-42: Comparison results of real-captured EVENTAID-B dataset (#14 B-XIAOYING)

3.2 Results on simulated EVENTAID-B-V2E dataset

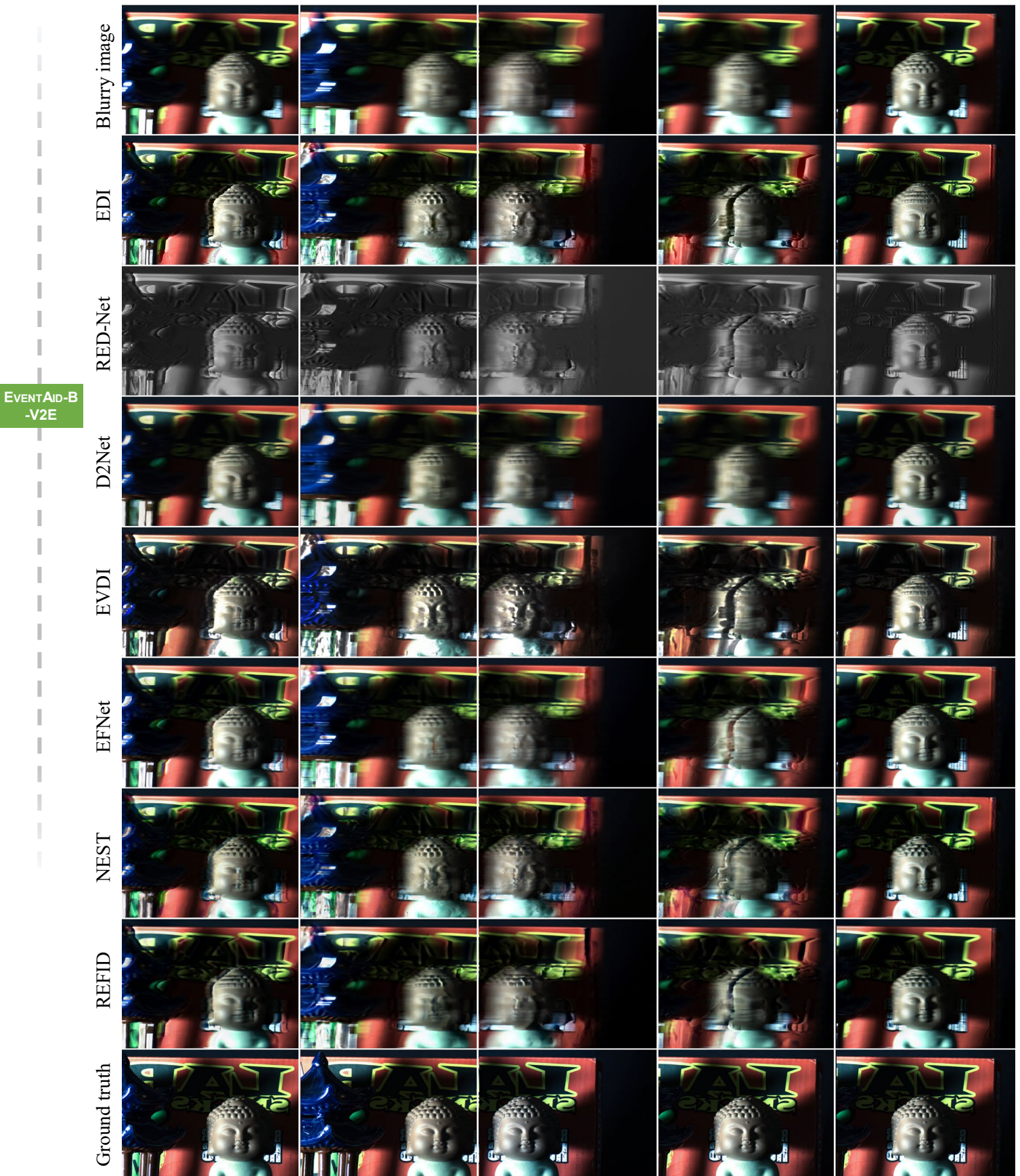


Figure S3-43: Comparison results of simulated EVENTAID-B-V2E dataset (#1 B-BOX)

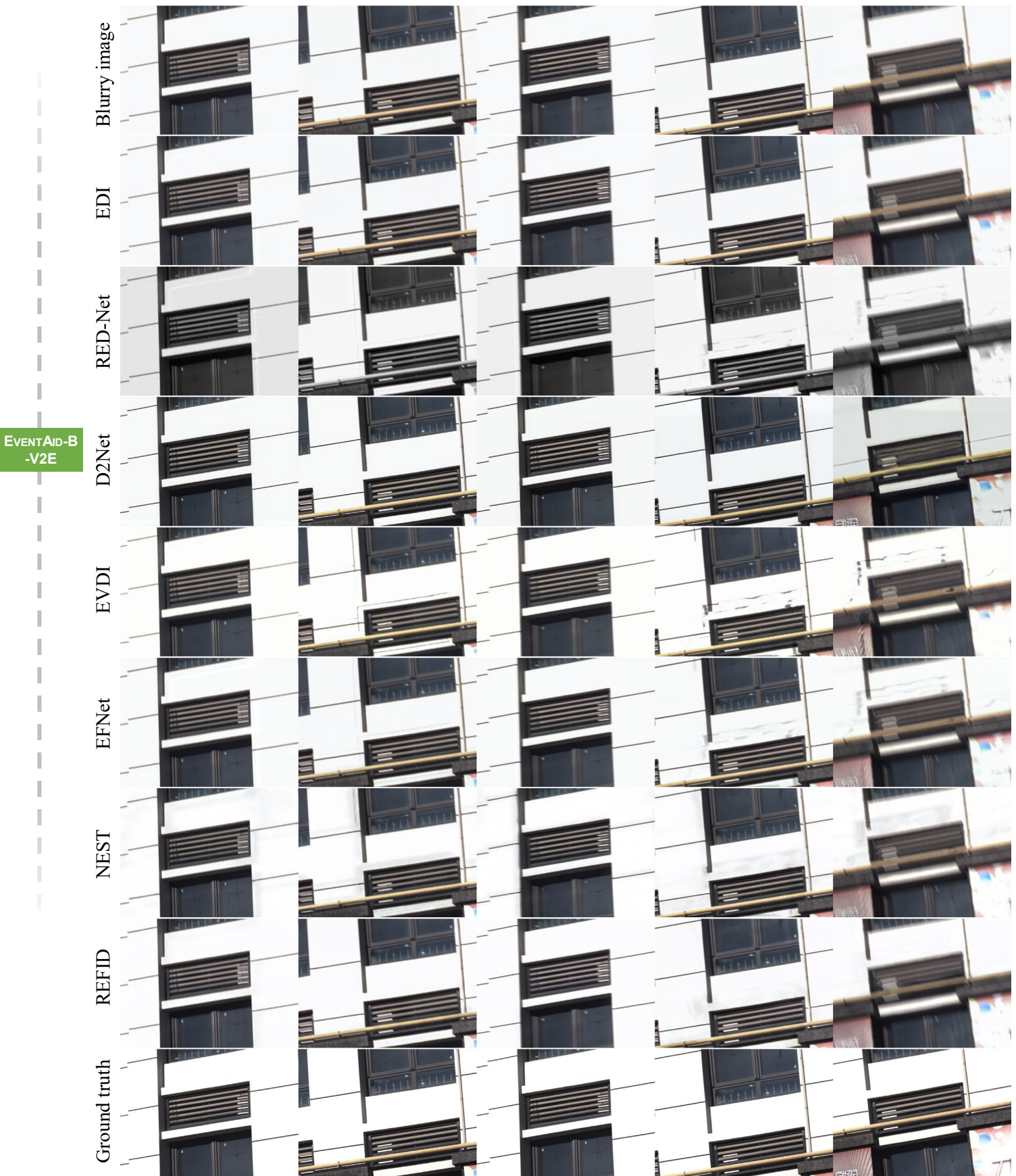


Figure S3-44: Comparison results of simulated EVENTAID-B-V2E dataset (#2 B-BUILDING)



Figure S3-45: Comparison results of simulated EVENTAID-B-V2E dataset (#3 B-DANCE)

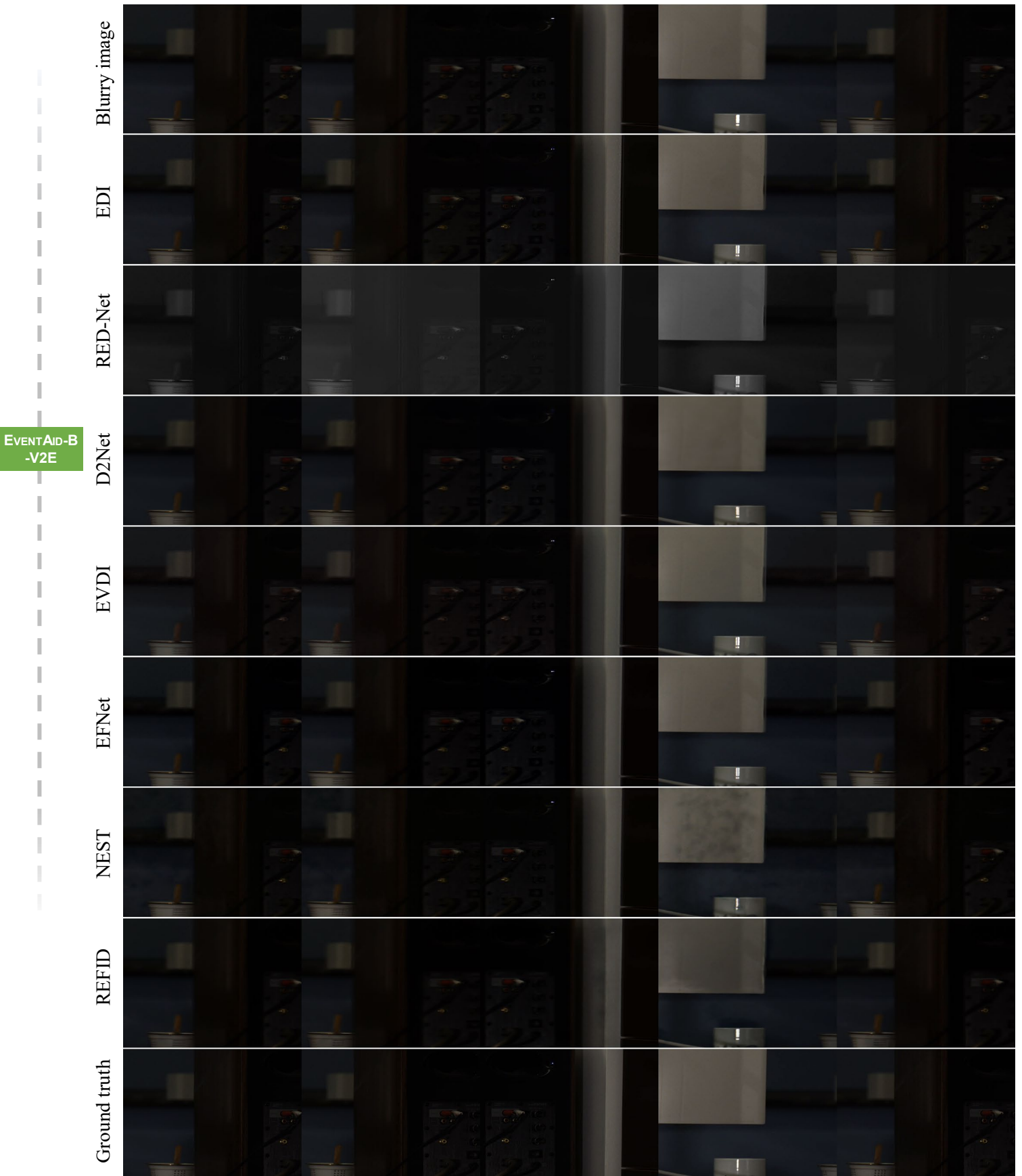


Figure S3-46: Comparison results of simulated EVENTAID-B-V2E dataset (#4 B-DESK)

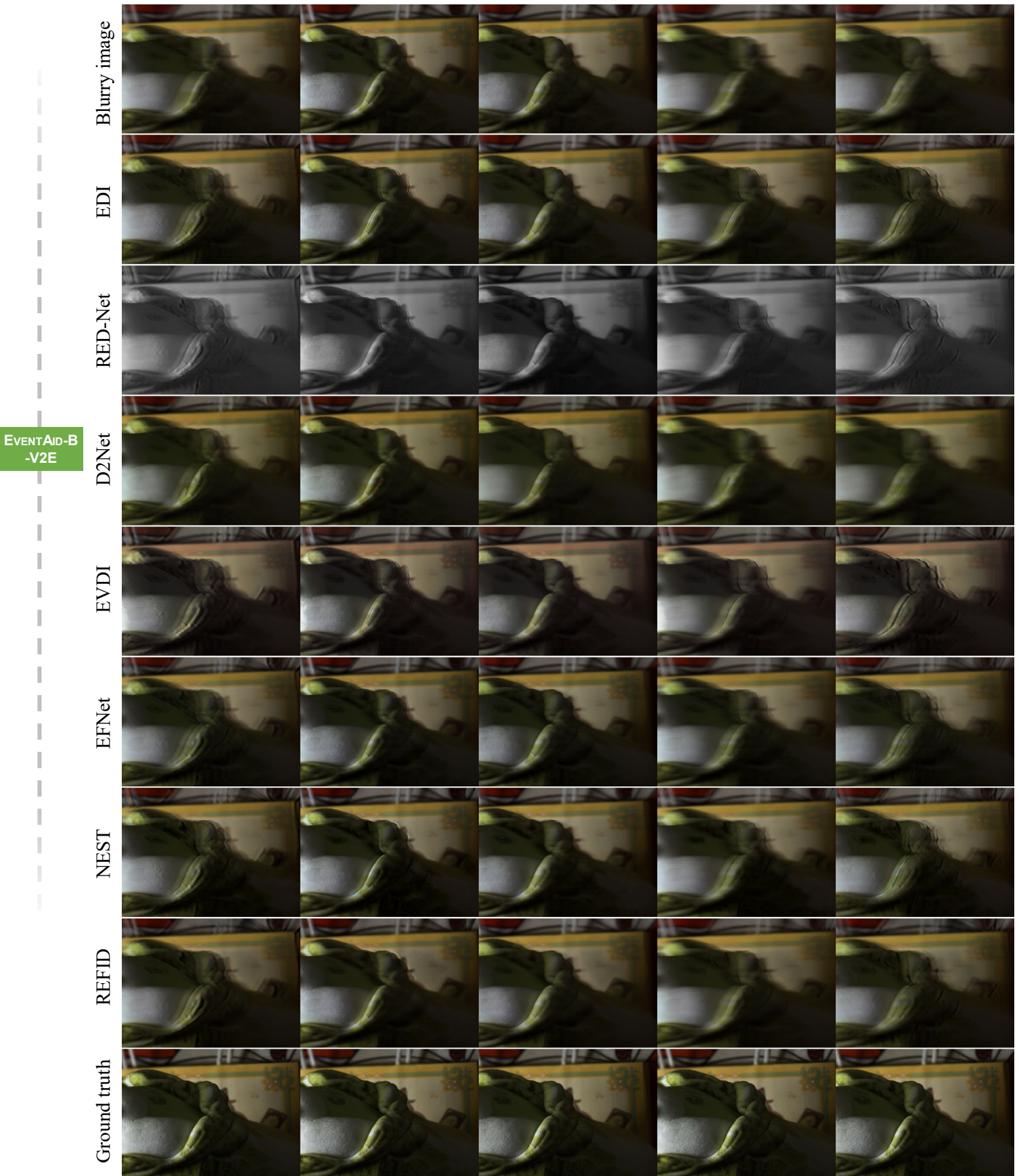


Figure S3-47: Comparison results of simulated EVENTAID-B-V2E dataset (#5 B-DOG)

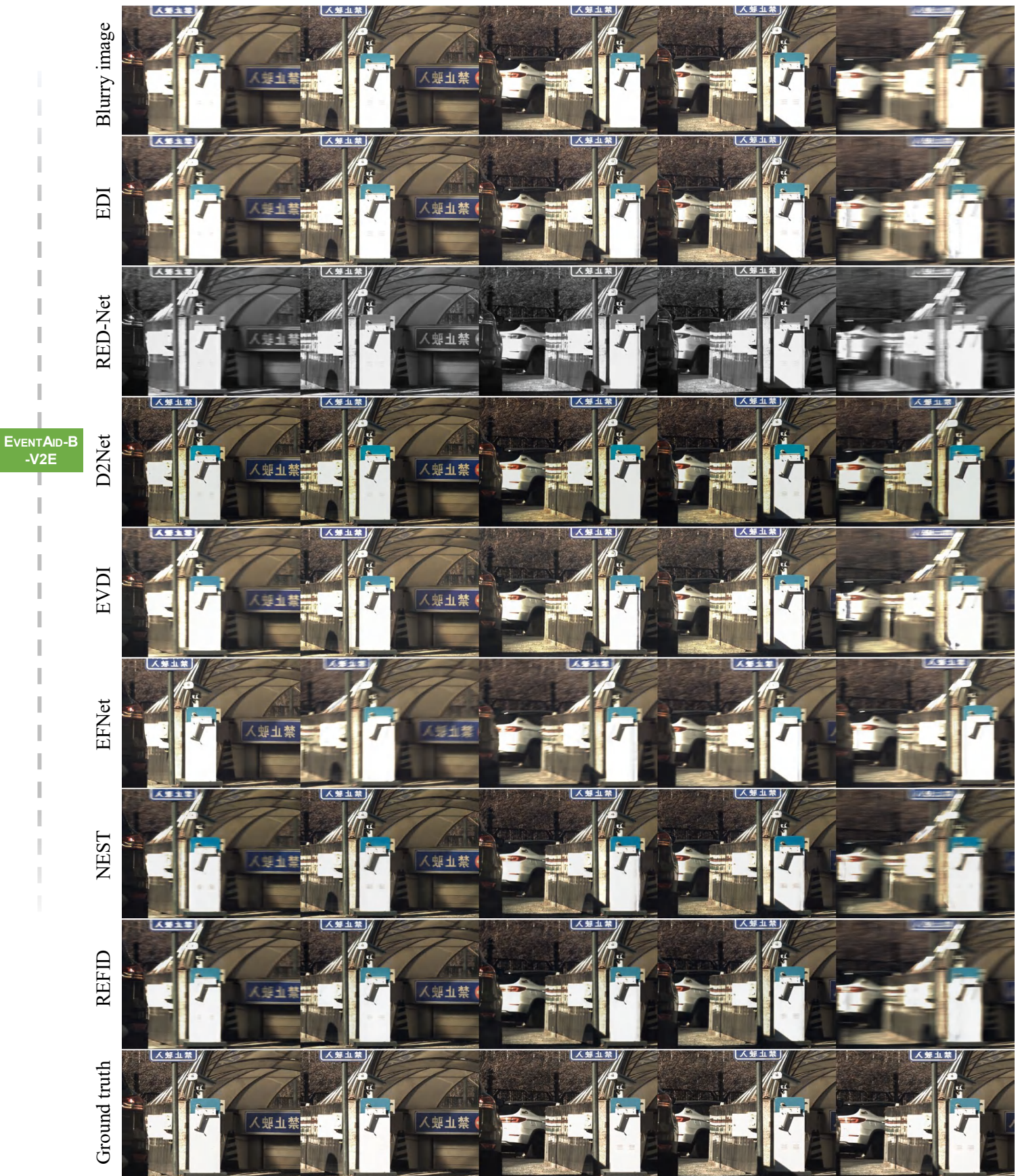


Figure S3-48: Comparison results of simulated EVENTAID-B-V2E dataset (#6 B-ENTRANCE)

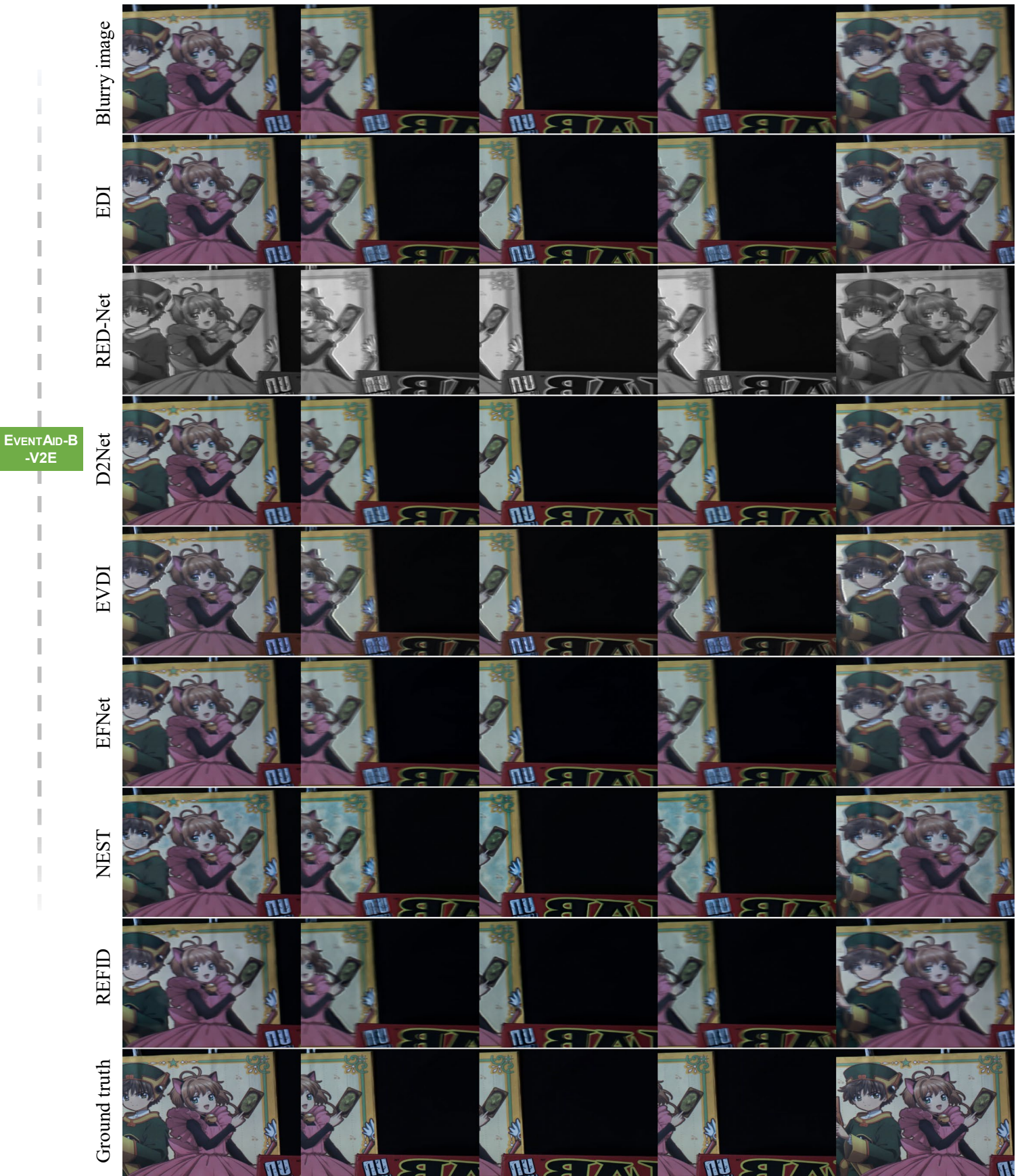


Figure S3-49: Comparison results of simulated EVENTAID-B-V2E dataset (#7 B-GLOBAL)

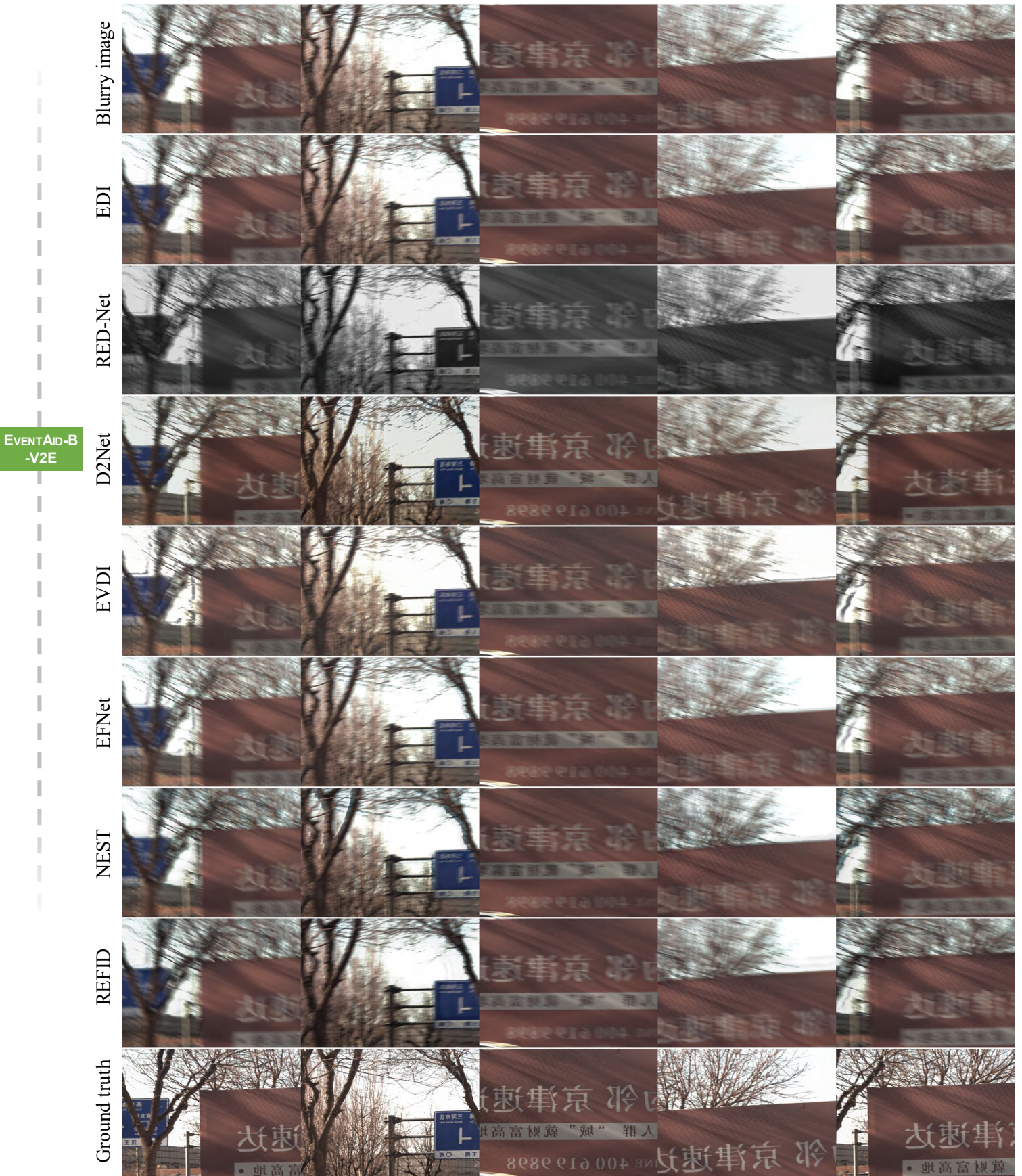


Figure S3-50: Comparison results of simulated EVENTAID-B-V2E dataset (#8 B-JINGJIN)

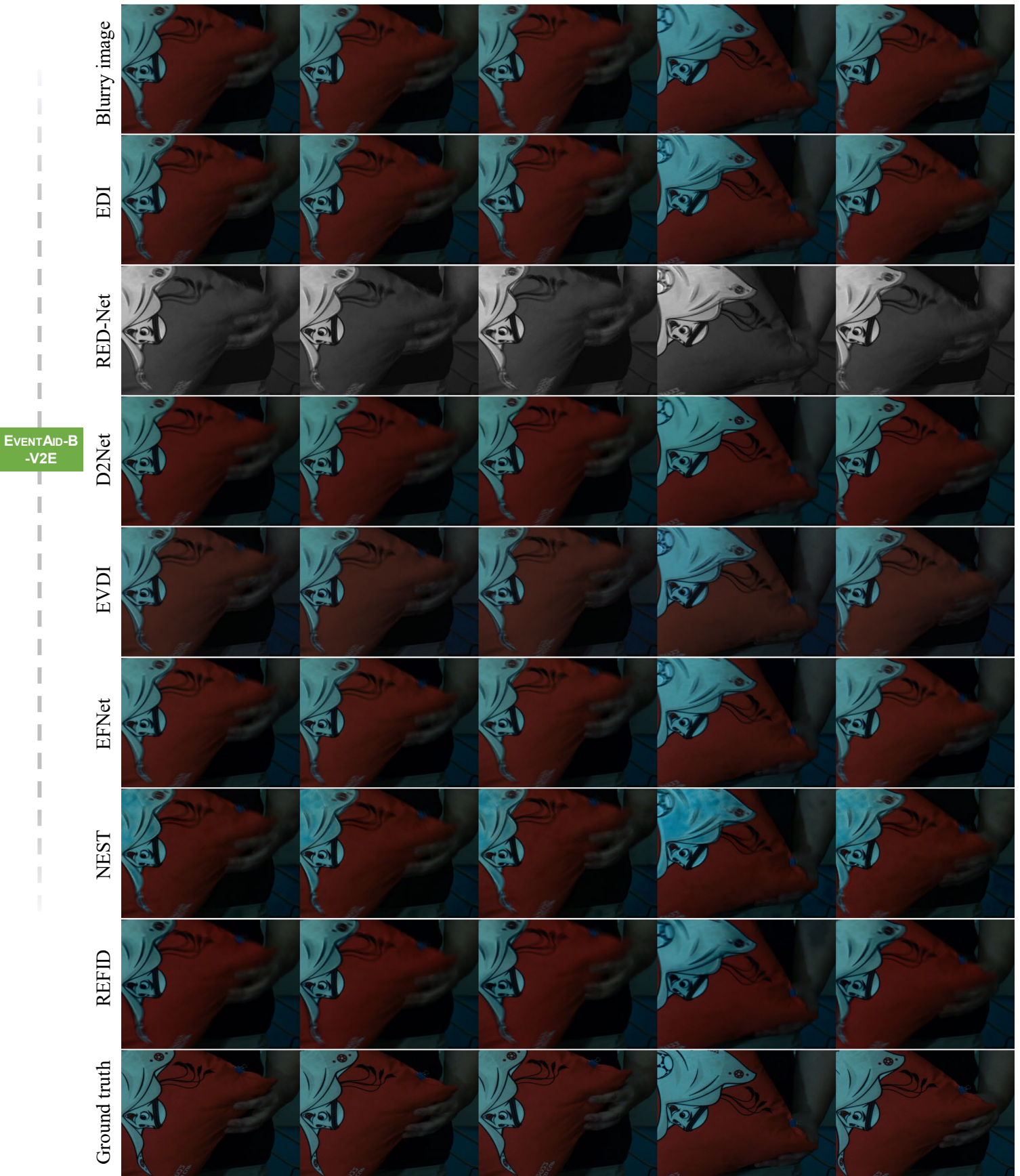


Figure S3-51: Comparison results of simulated EVENTAID-B-V2E dataset (#9 B-PILLOW)



Figure S3-52: Comparison results of simulated EVENTAID-B-V2E dataset (#10 B-PLANE)

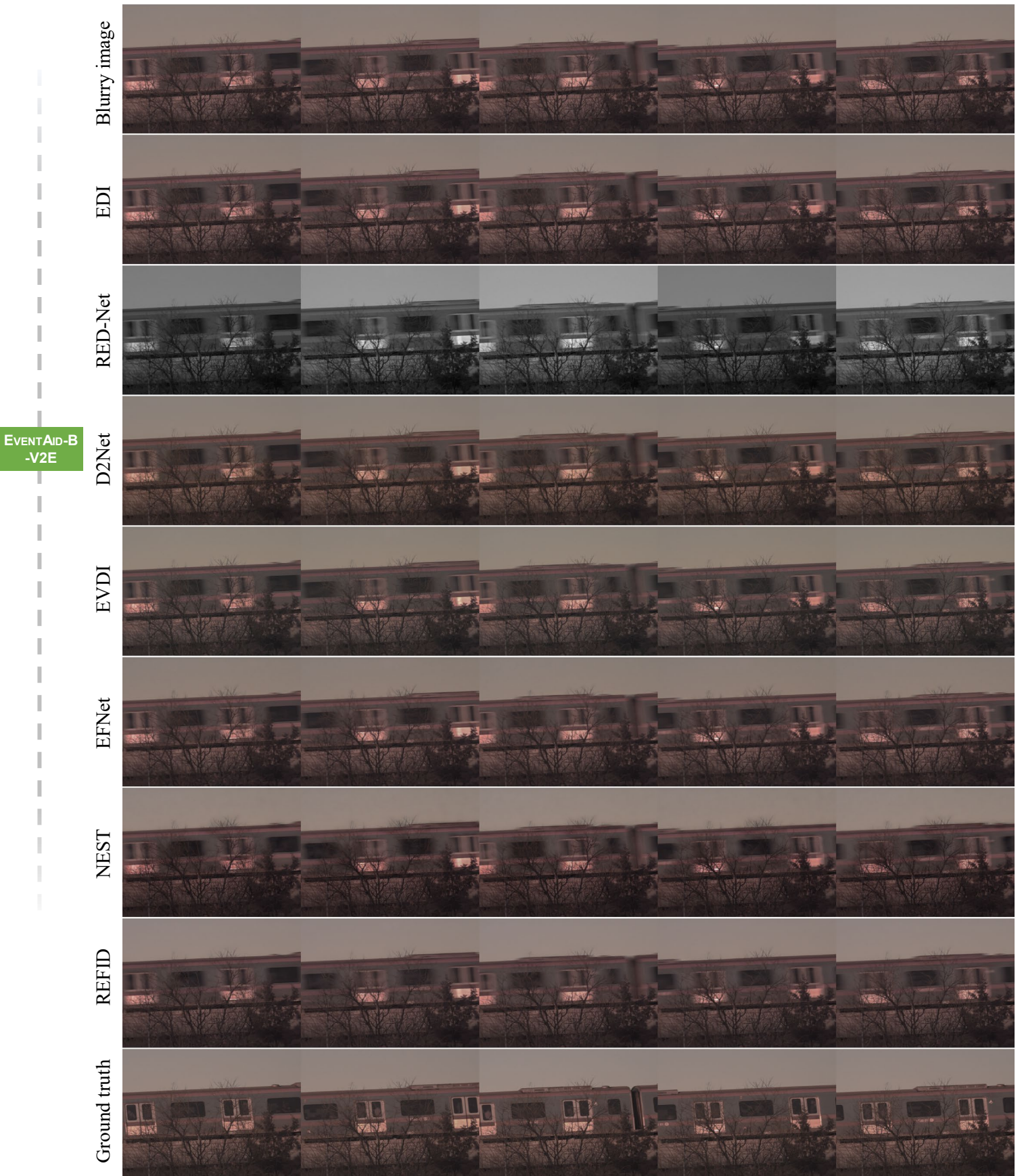


Figure S3-53: Comparison results of simulated EVENTAID-B-V2E dataset (#11 B-SUBWAY)

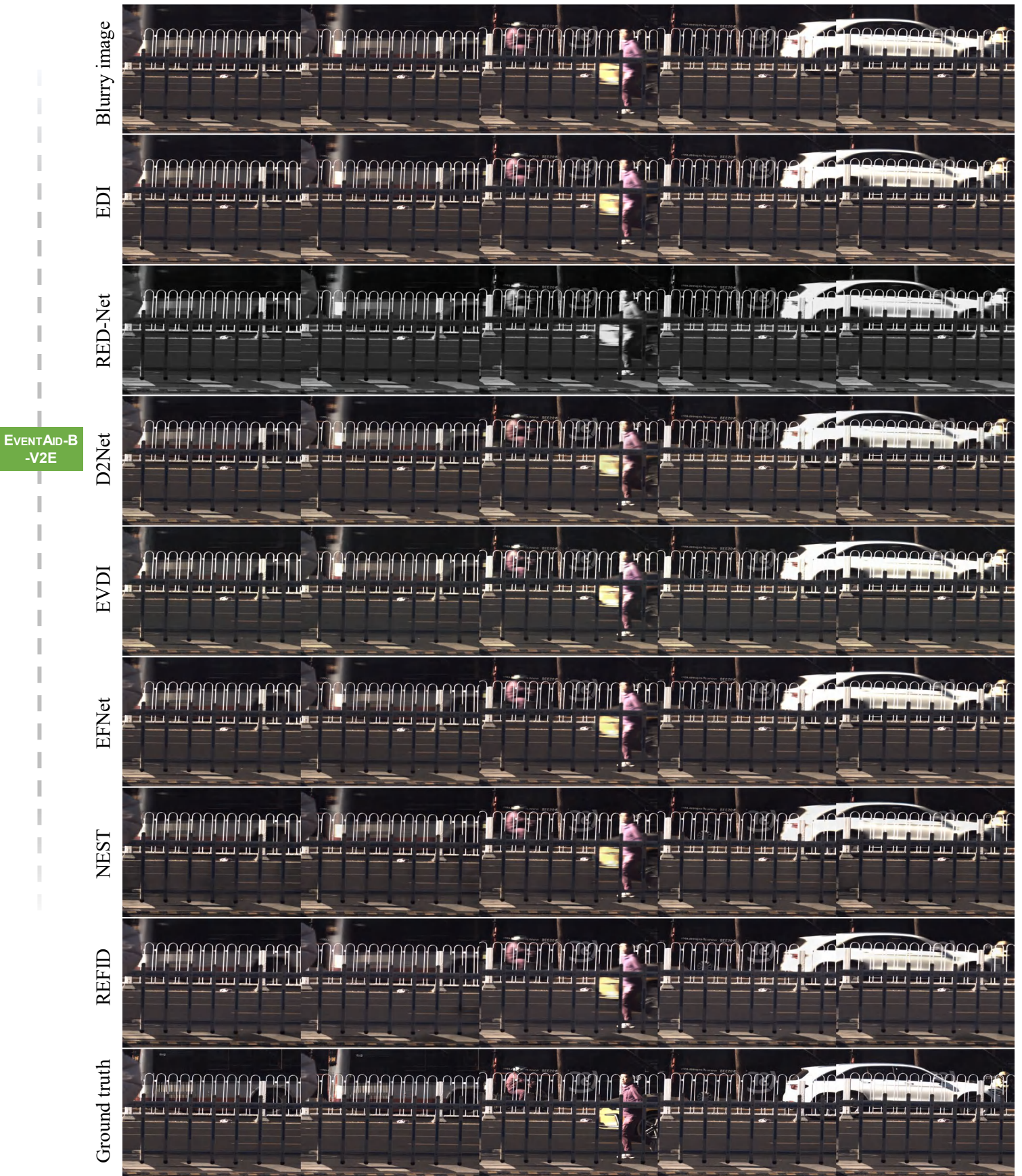


Figure S3-54: Comparison results of simulated EVENTAID-B-V2E dataset (#12 B-TRAFFIC)



Figure S3-55: Comparison results of simulated EVENTAID-B-V2E dataset (#13 B-WINDMILL)

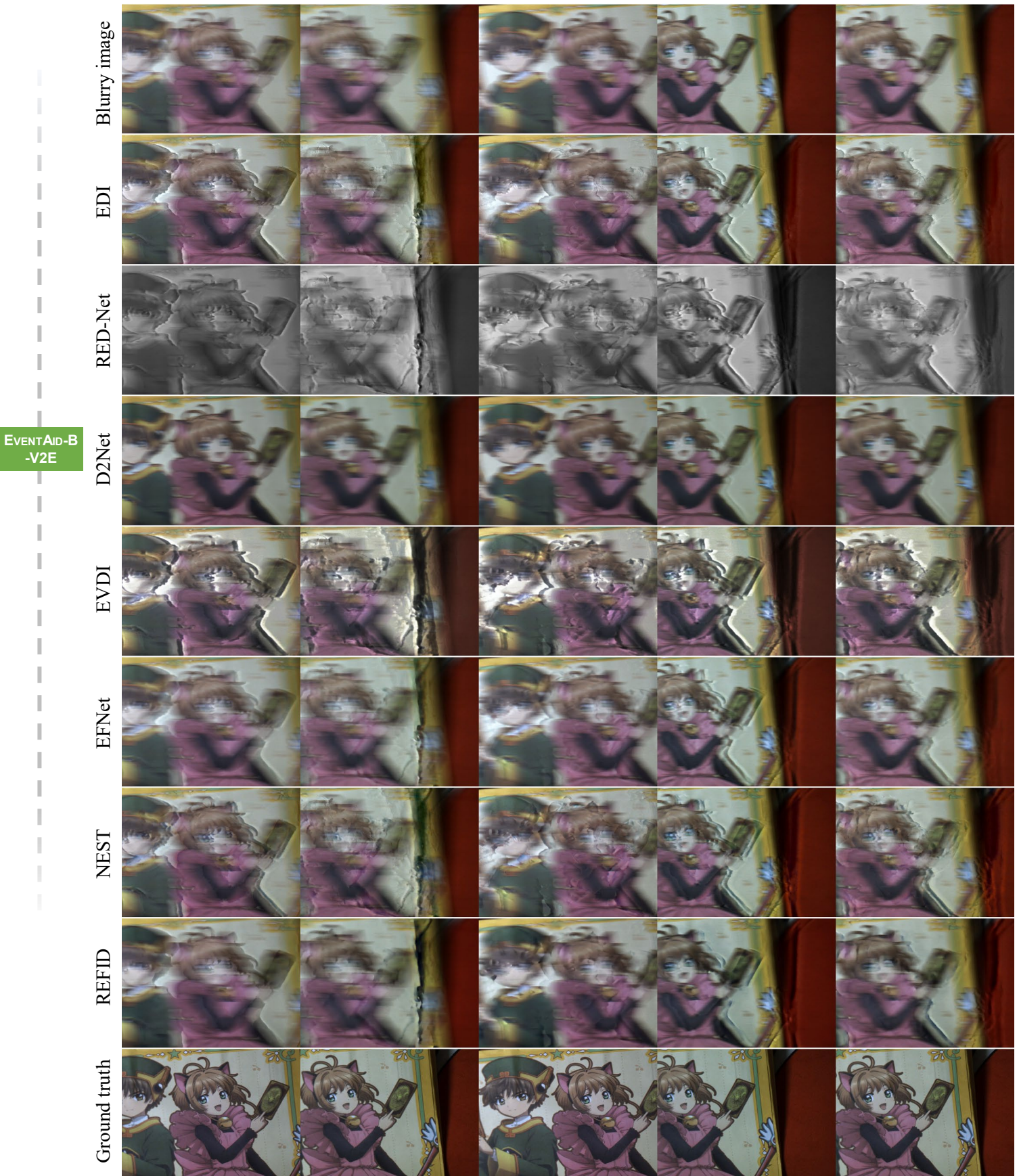


Figure S3-56: Comparison results of simulated EVENTAID-B-V2E dataset (#14 B-XIAOYING)

3.3 Results on simulated EVENTAID-B-VM dataset

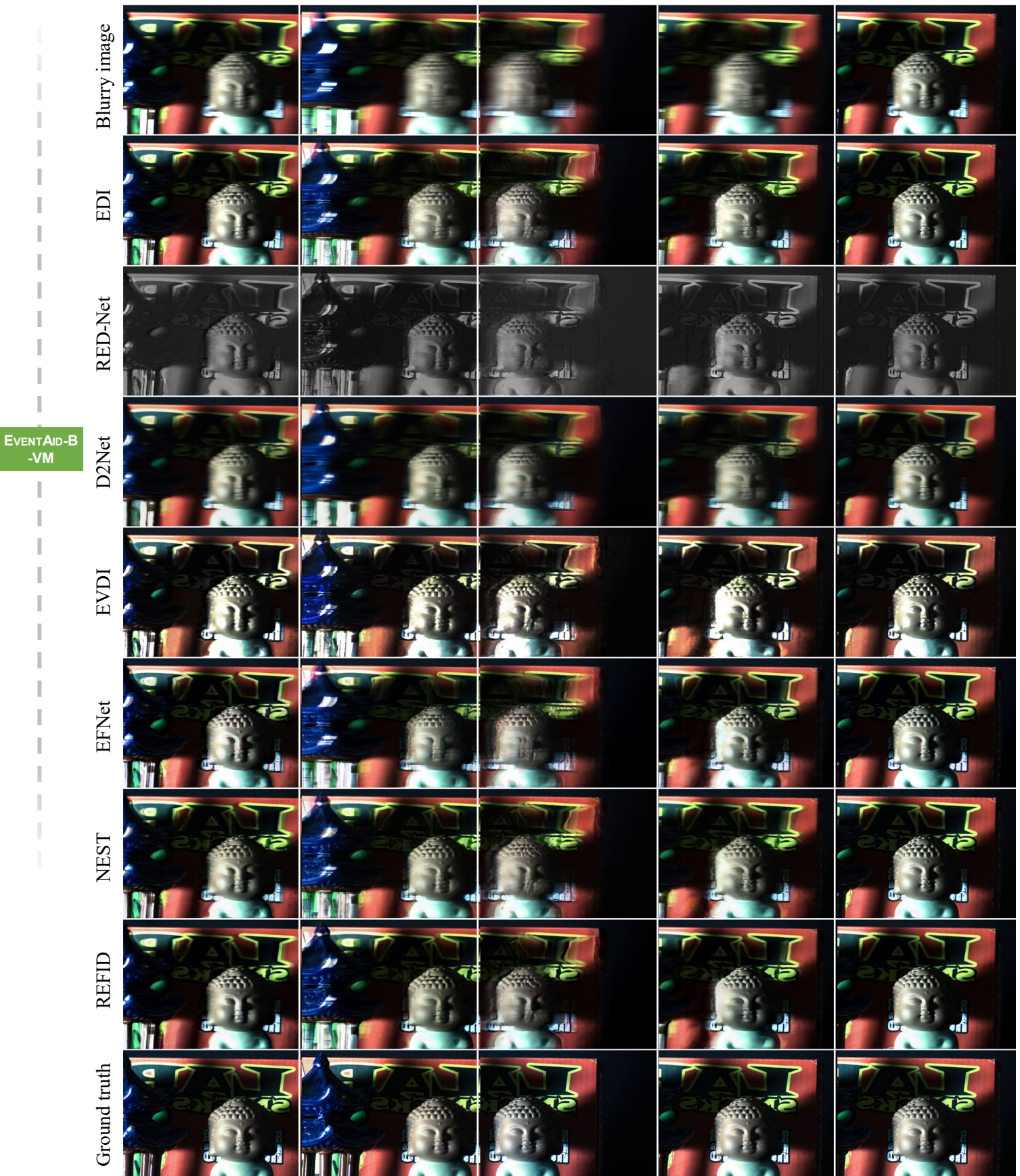


Figure S3-57: Comparison results of simulated EVENTAID-B-VM dataset (#1 B-BOX)

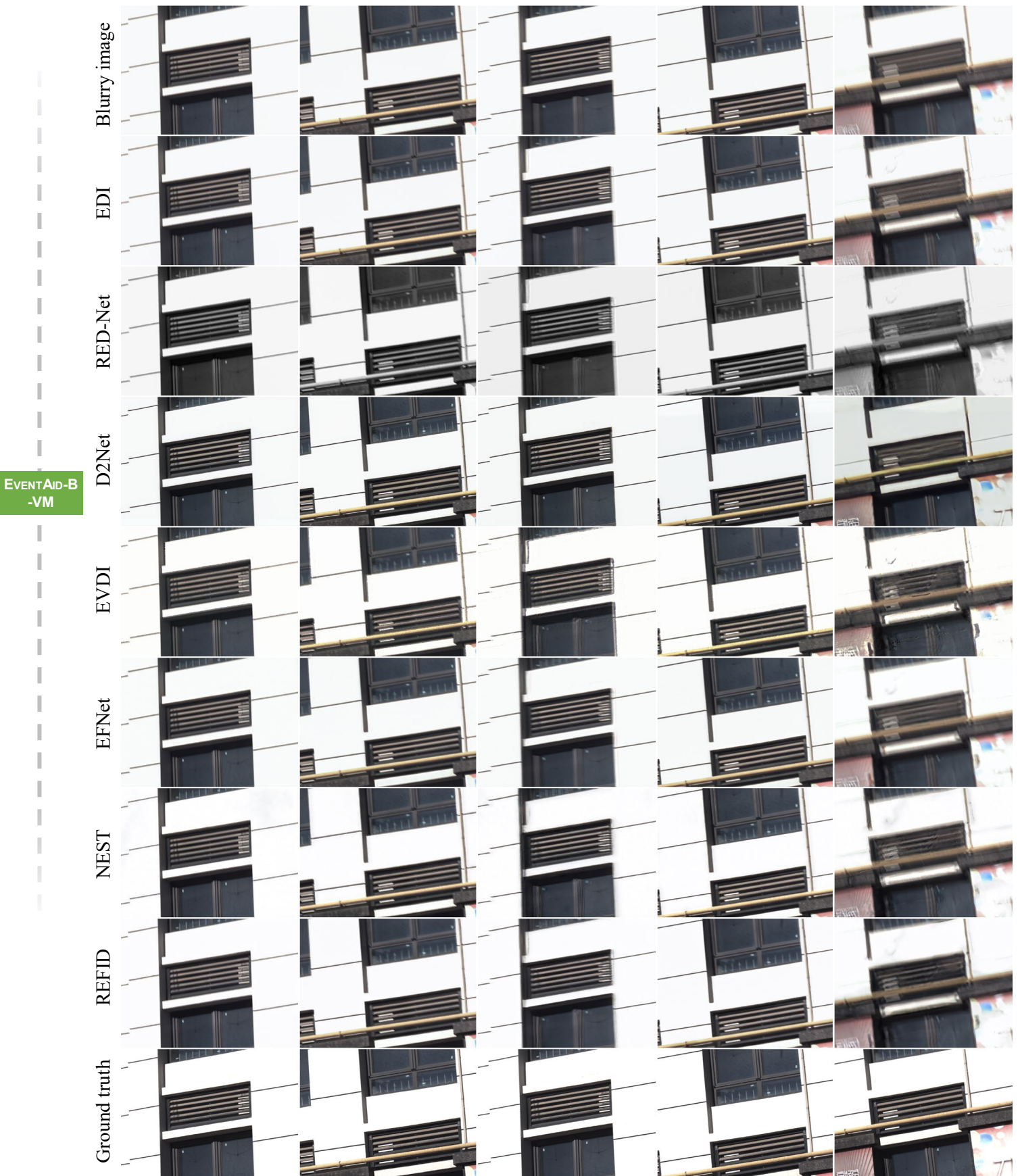


Figure S3-58: Comparison results of simulated EVENTAID-B-VM dataset (#2 B-BUILDING)



Figure S3-59: Comparison results of simulated EVENTAID-B-VM dataset (#3 B-DANCE)

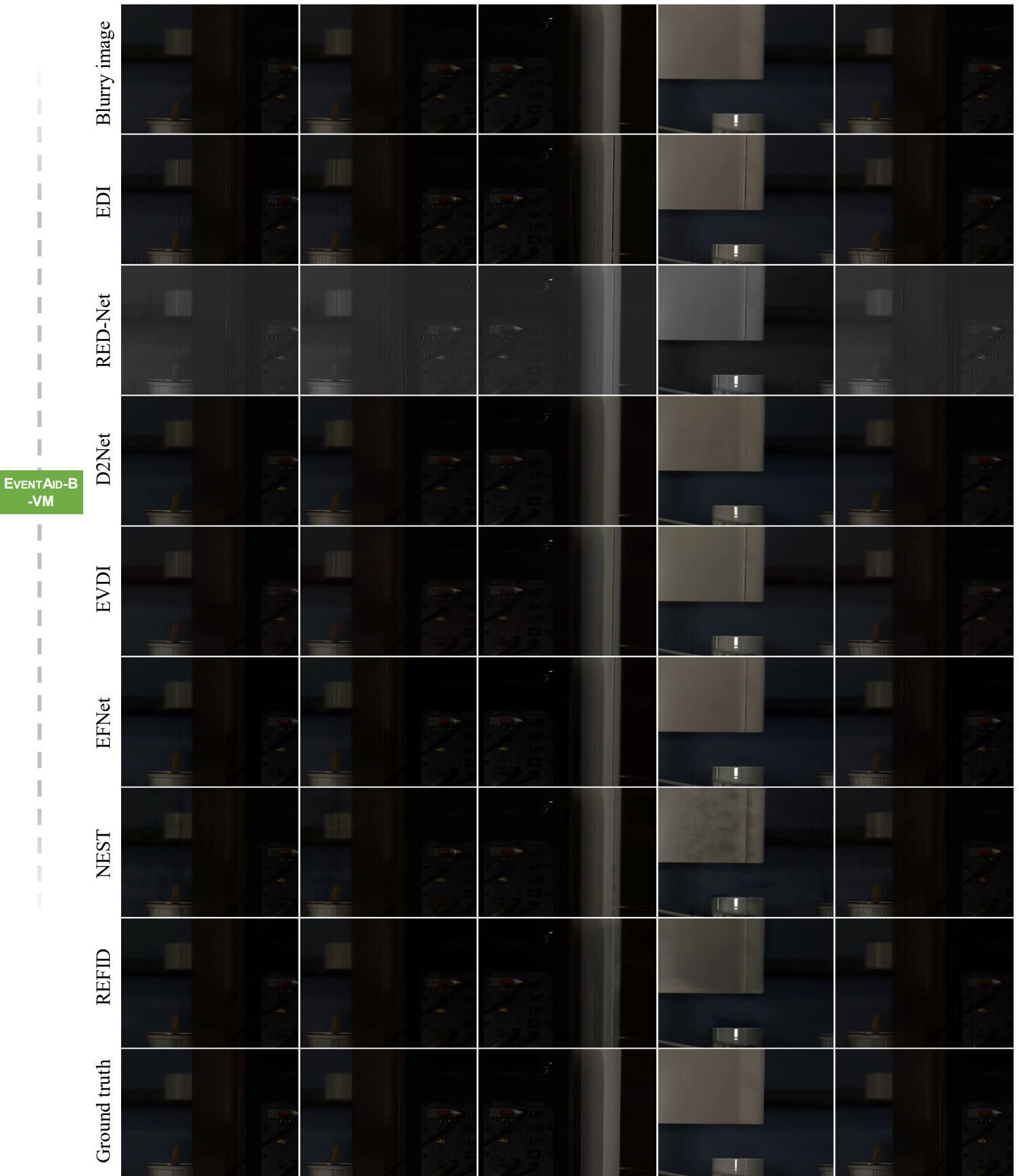


Figure S3-60: Comparison results of simulated EVENTAID-B-VM dataset (#4 B-DESK)

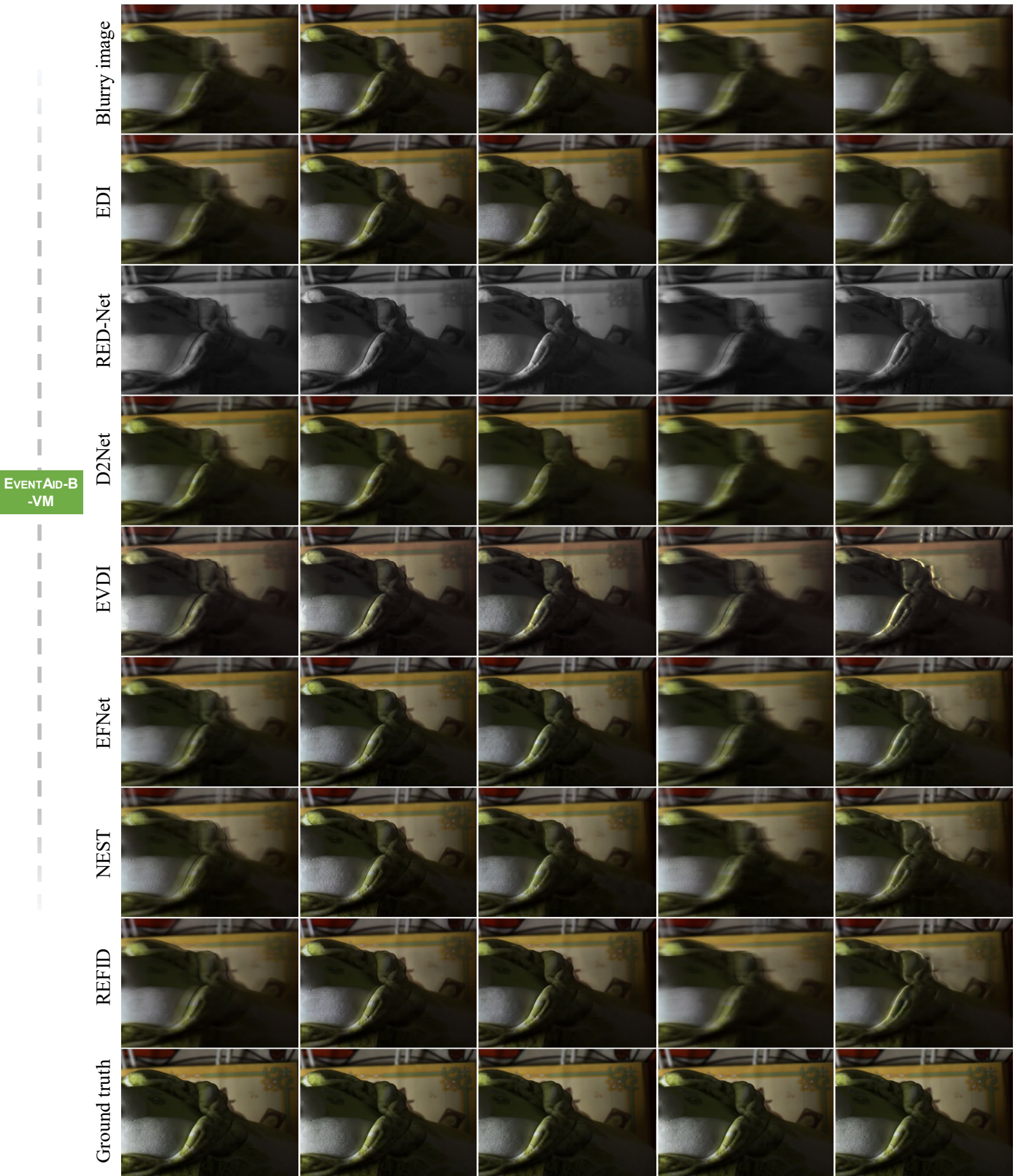


Figure S3-61: Comparison results of simulated EVENTAID-B-VM dataset (#5 B-DOG)

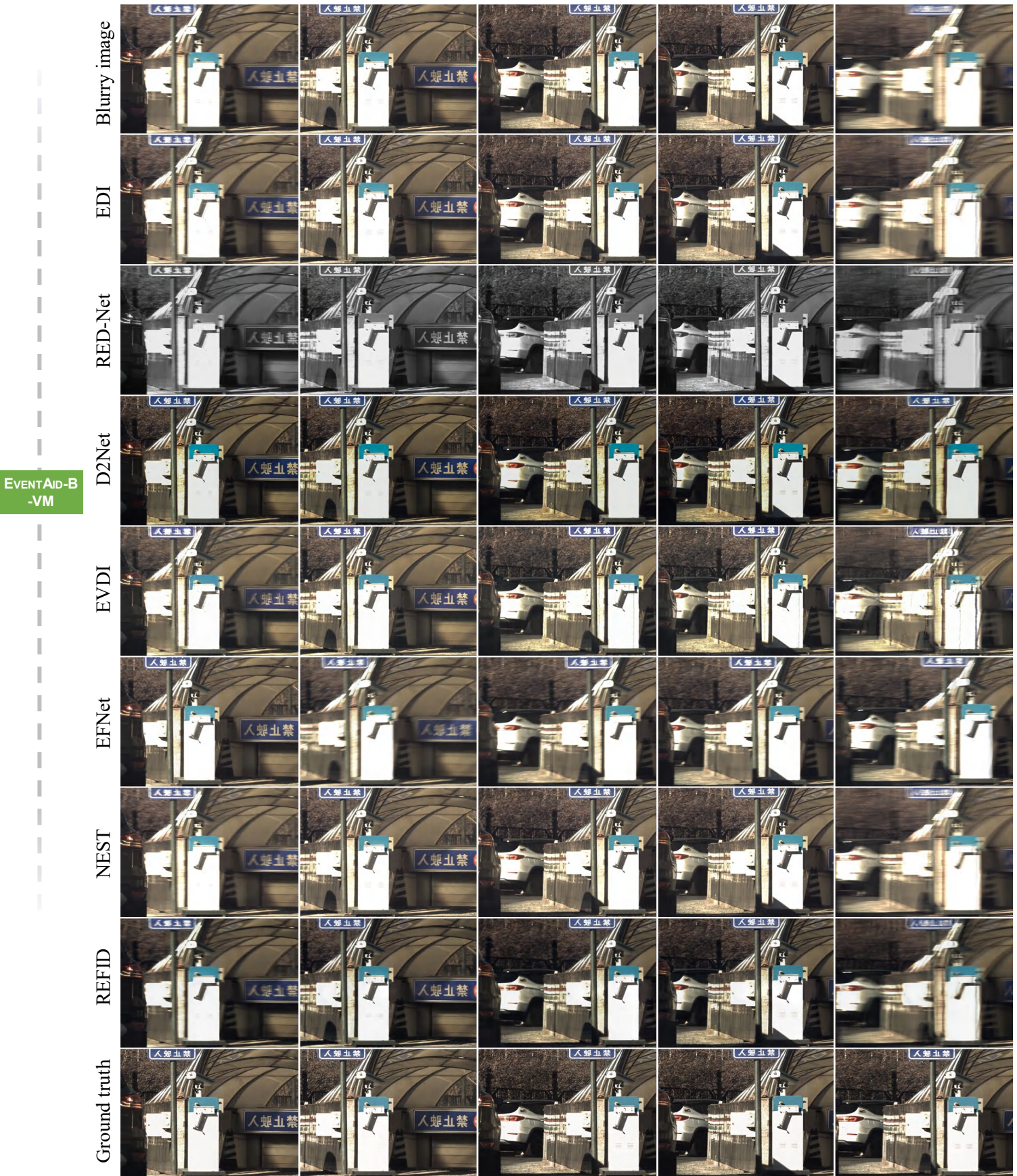


Figure S3-62: Comparison results of simulated EVENTAID-B-VM dataset (#6 B-ENTRANCE)

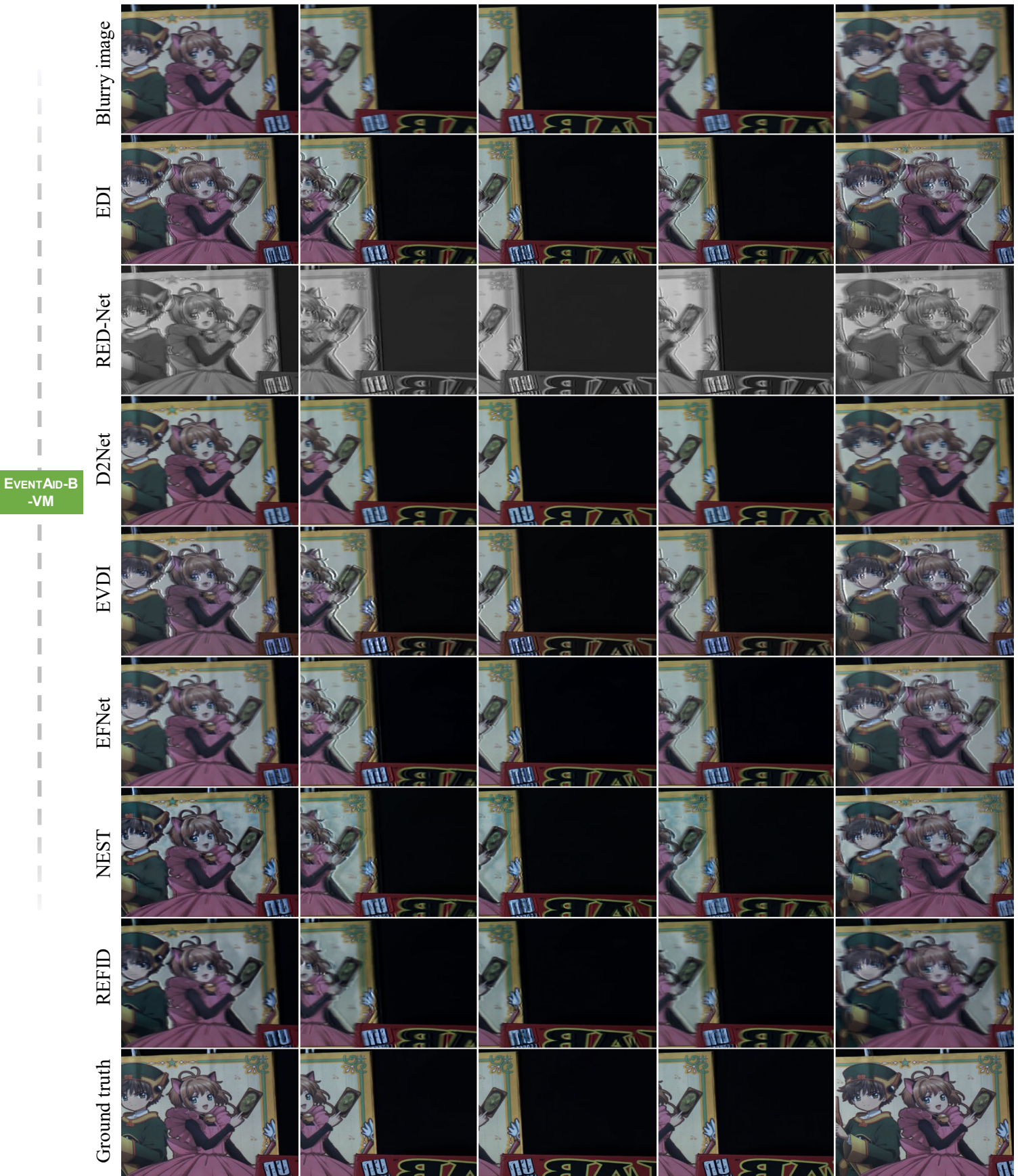


Figure S3-63: Comparison results of simulated EVENTAID-B-VM dataset (#7 B-GLOBAL)

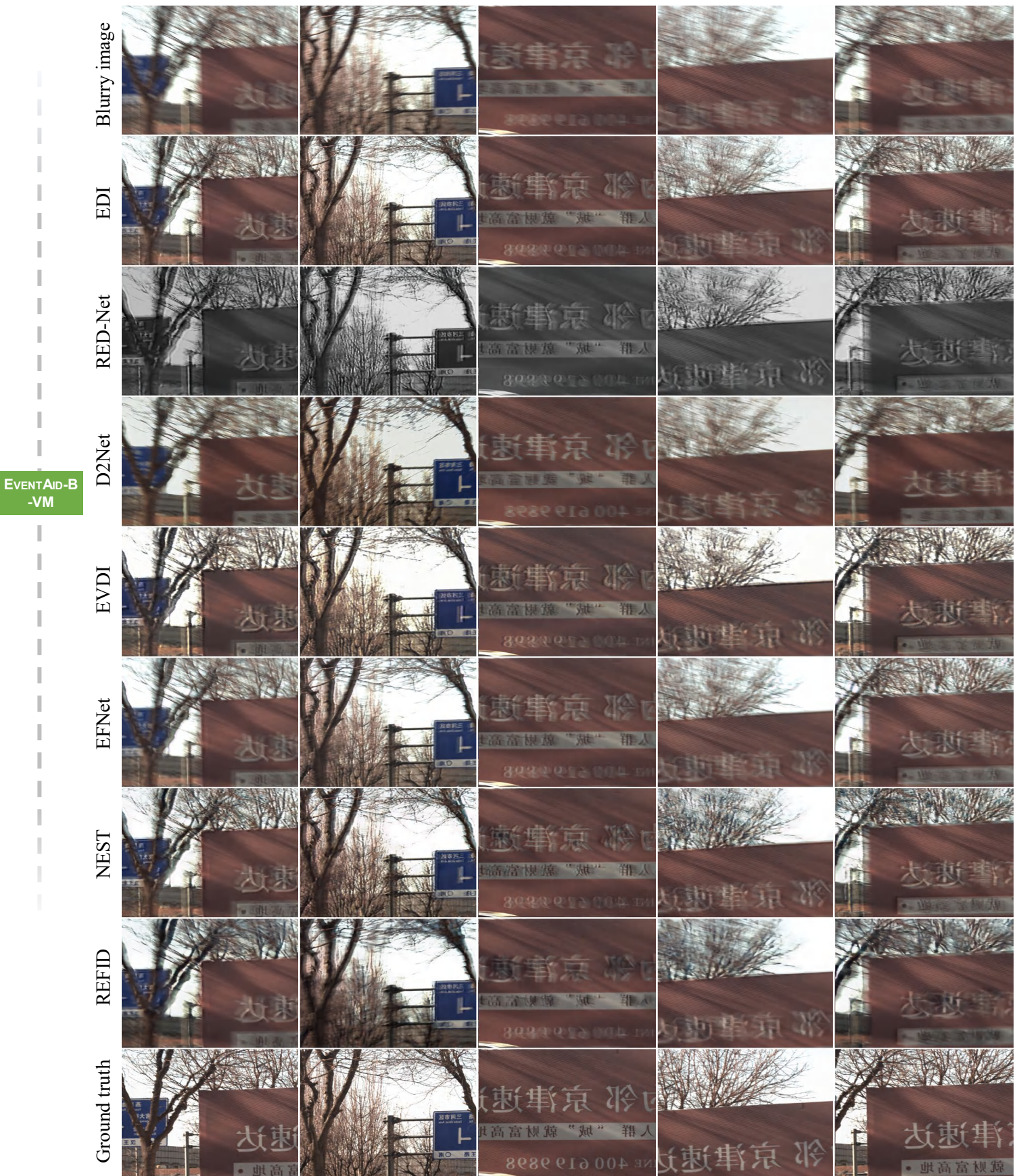


Figure S3-64: Comparison results of simulated EVENTAID-B-VM dataset (#8 B-JINGJIN)

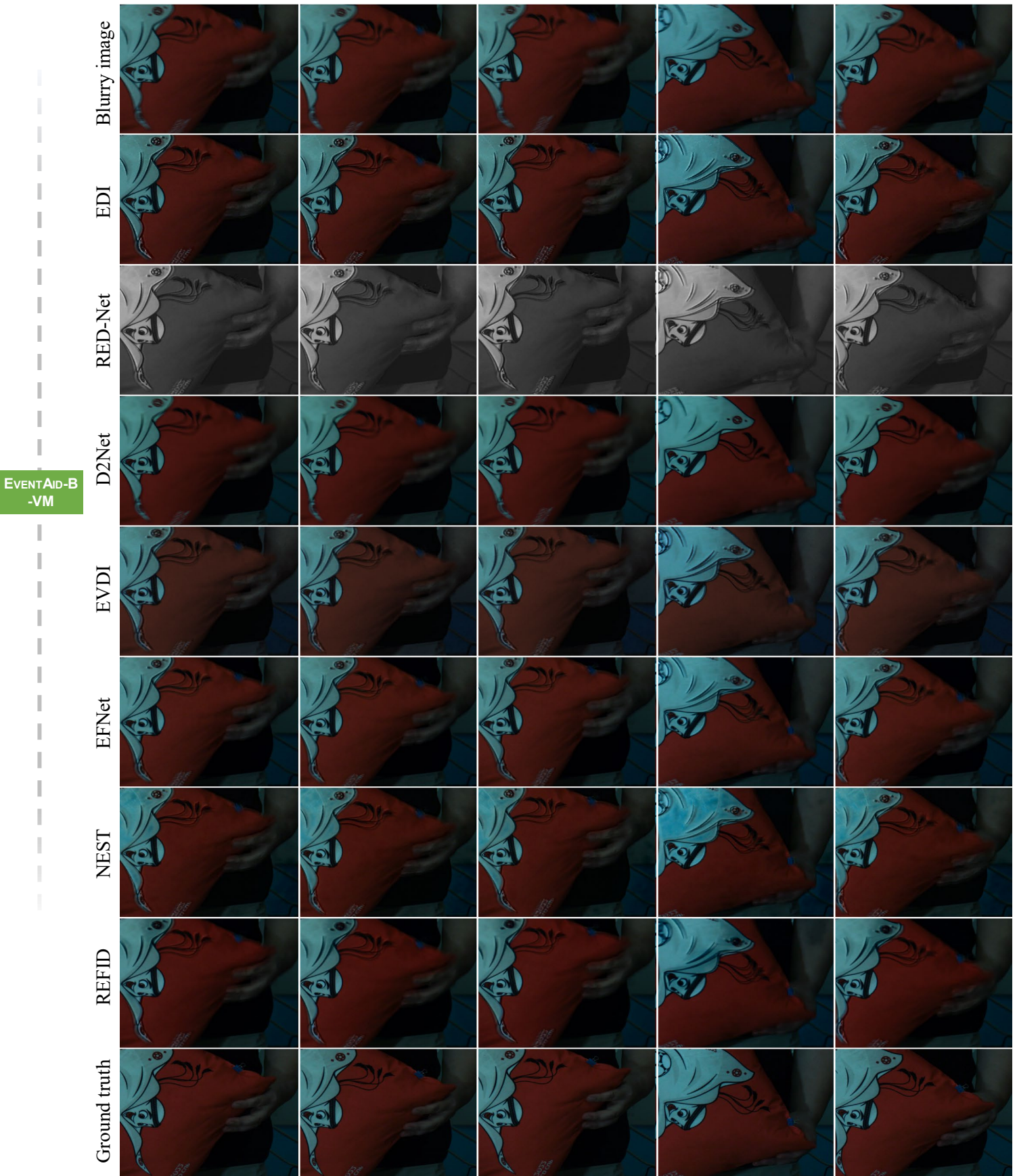


Figure S3-65: Comparison results of simulated EVENTAID-B-VM dataset (#9 B-PILLOW)

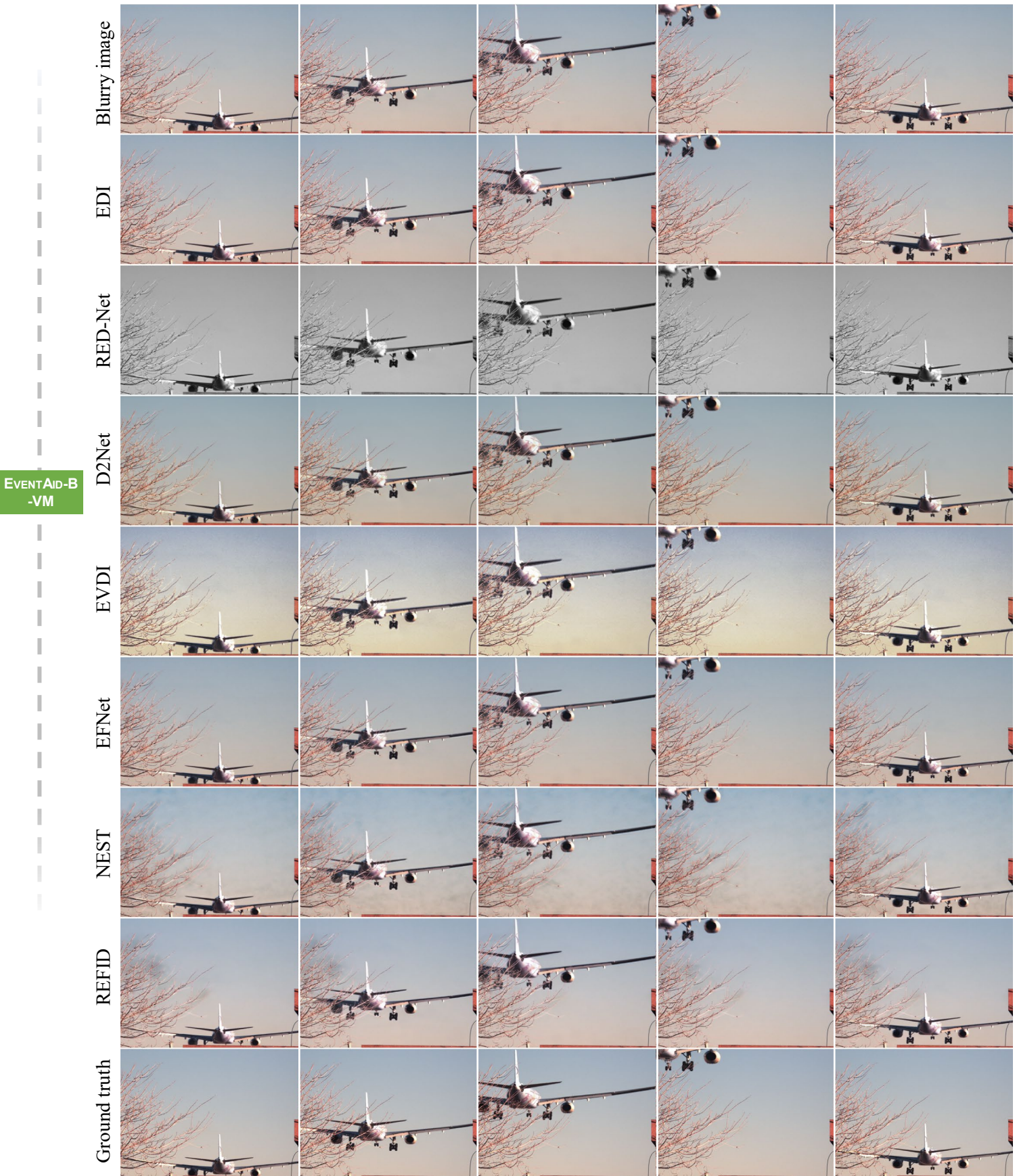


Figure S3-66: Comparison results of simulated EVENTAID-B-VM dataset (#10 B-PLANE)

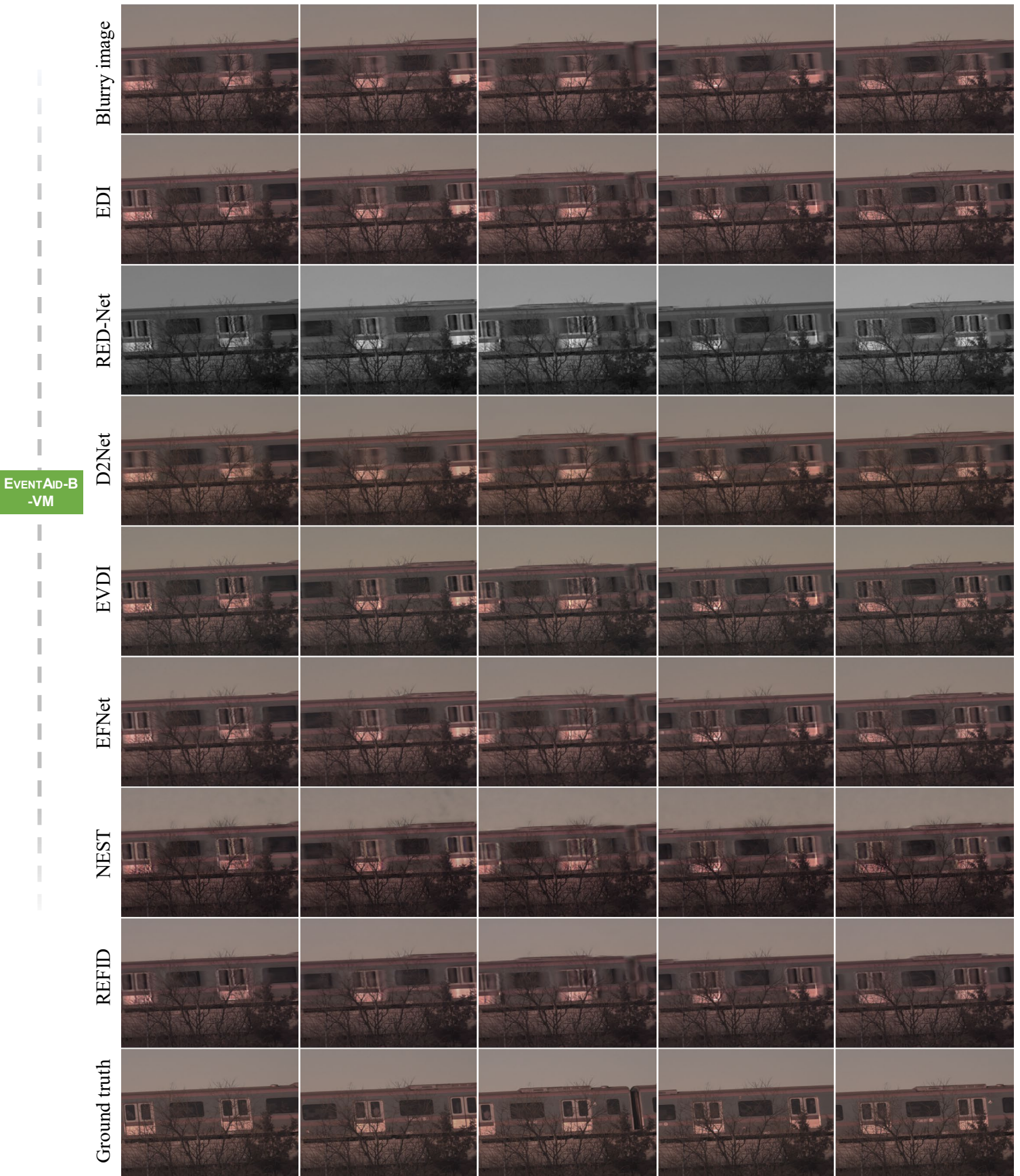


Figure S3-67: Comparison results of simulated EVENTAID-B-VM dataset (#11 B-SUBWAY)

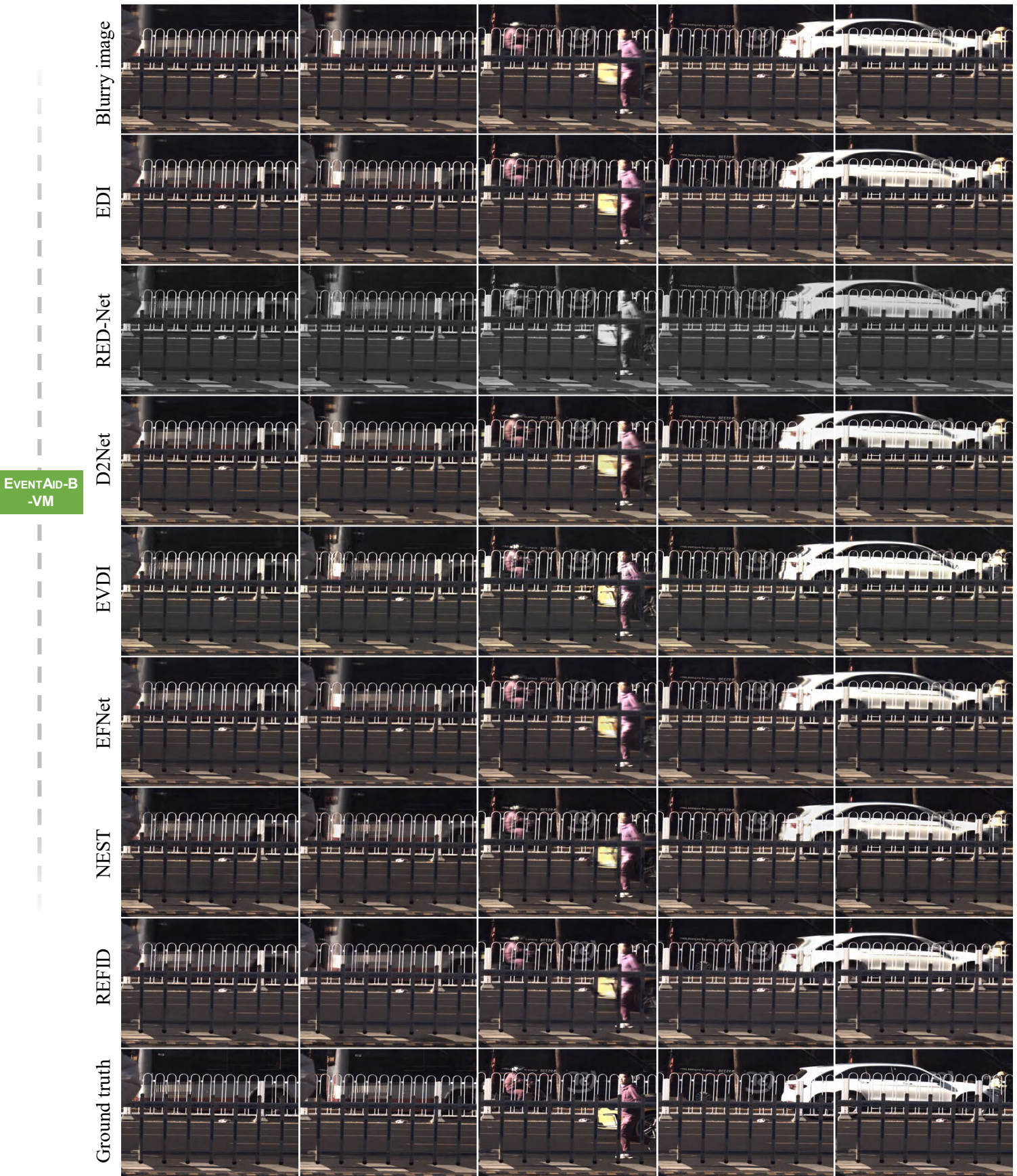


Figure S3-68: Comparison results of simulated EVENTAID-B-VM dataset (#12 B-TRAFFIC)

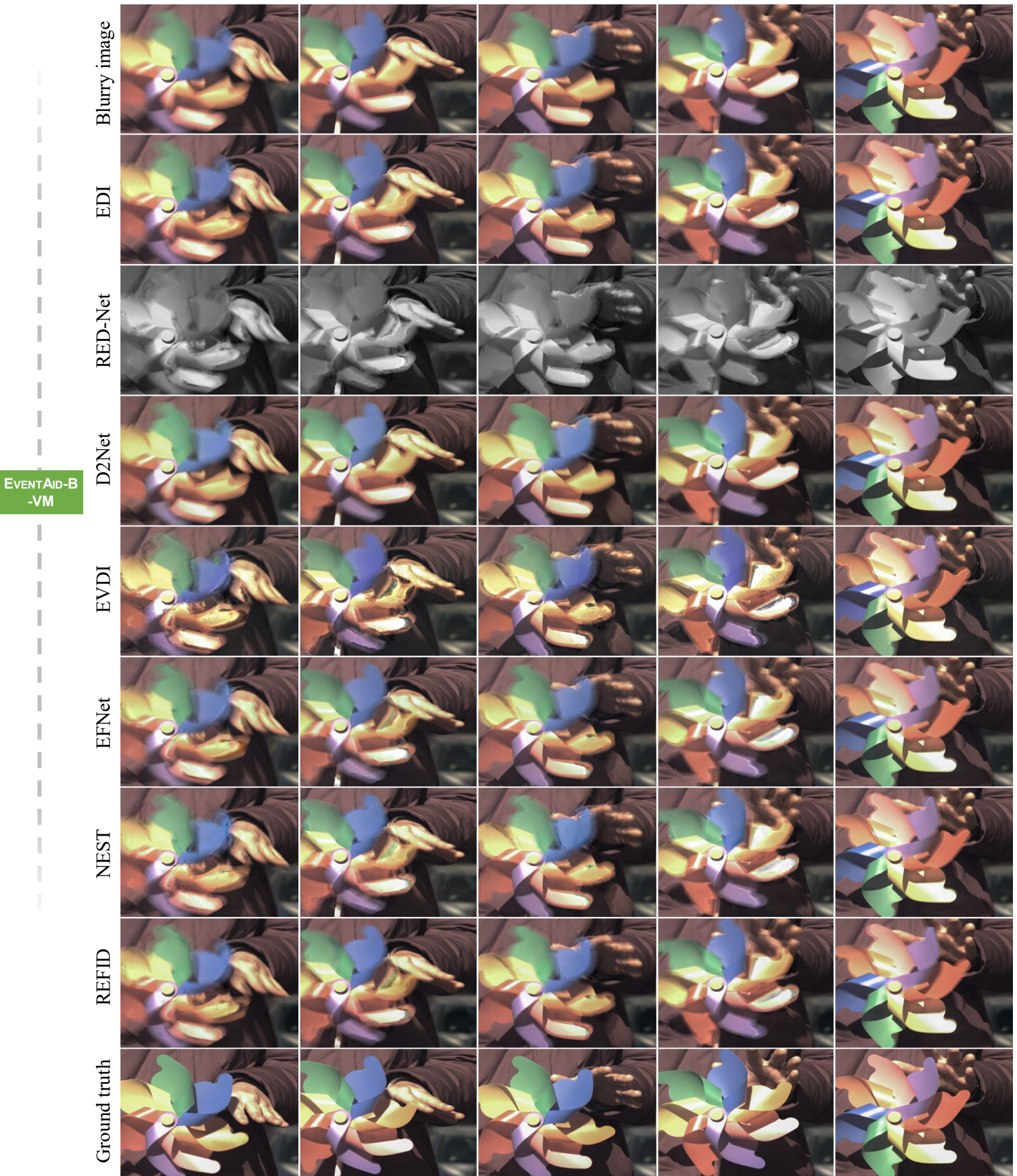


Figure S3-69: Comparison results of simulated EVENTAID-B-VM dataset (#13 B-WINDMILL)

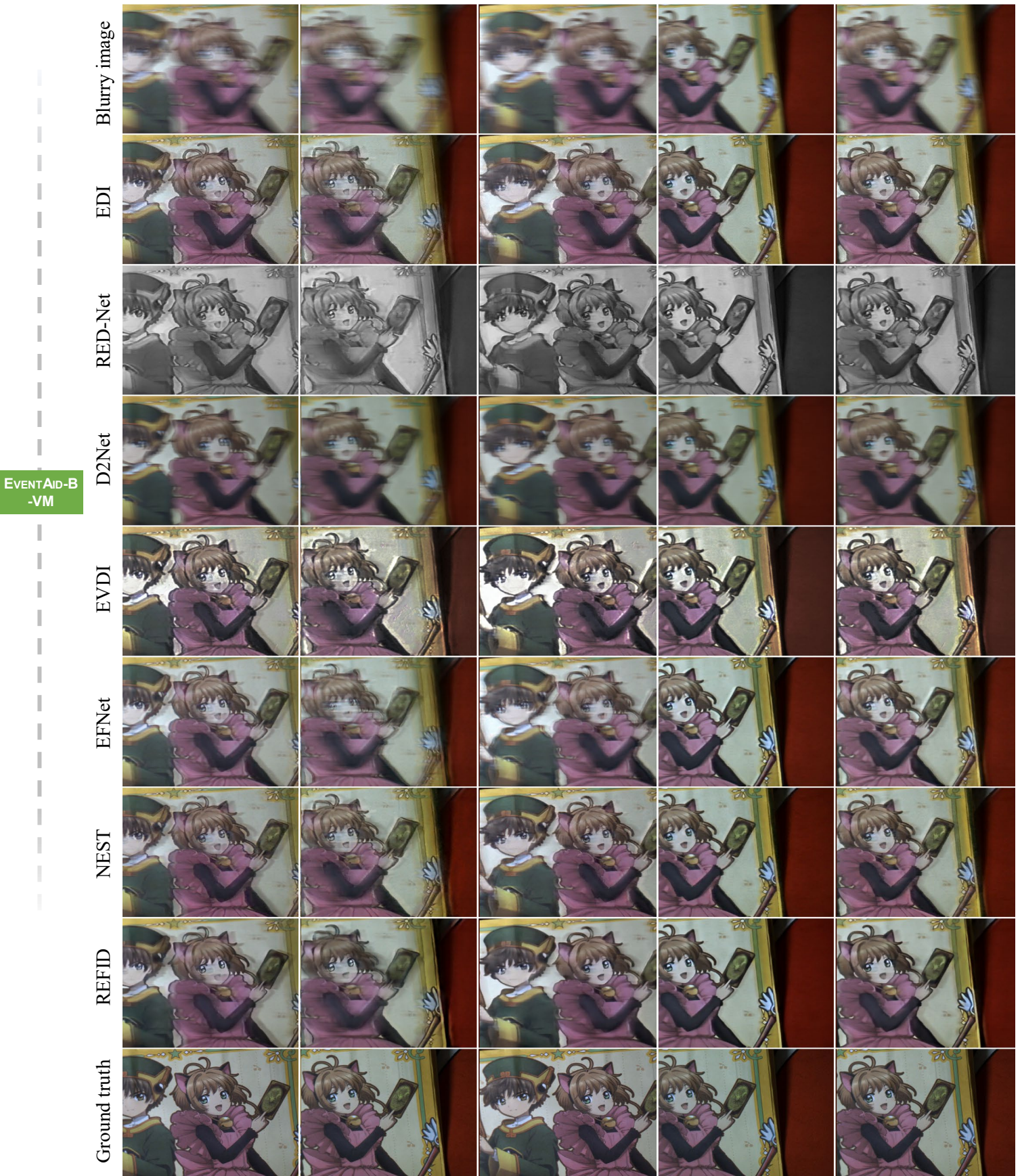
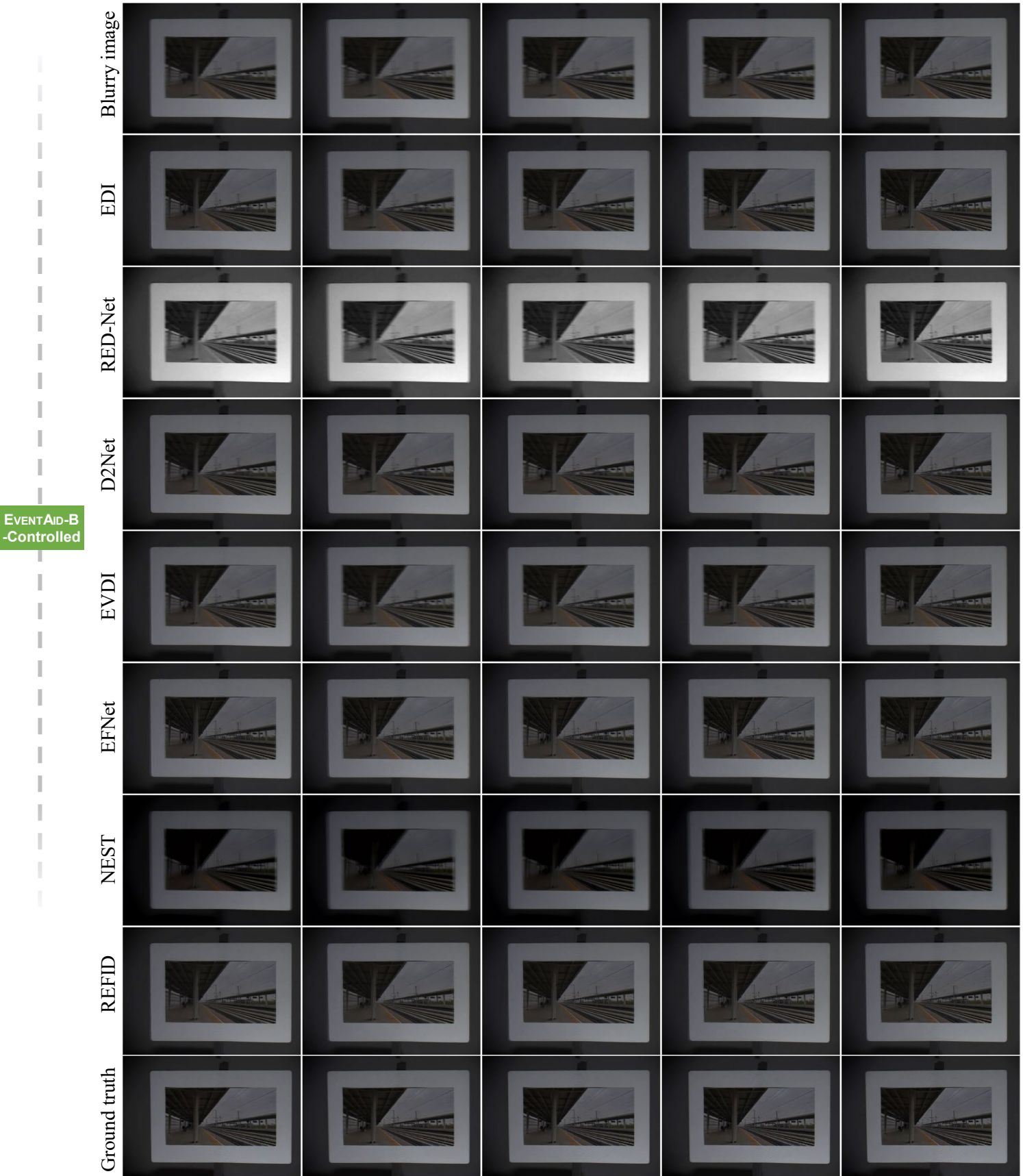
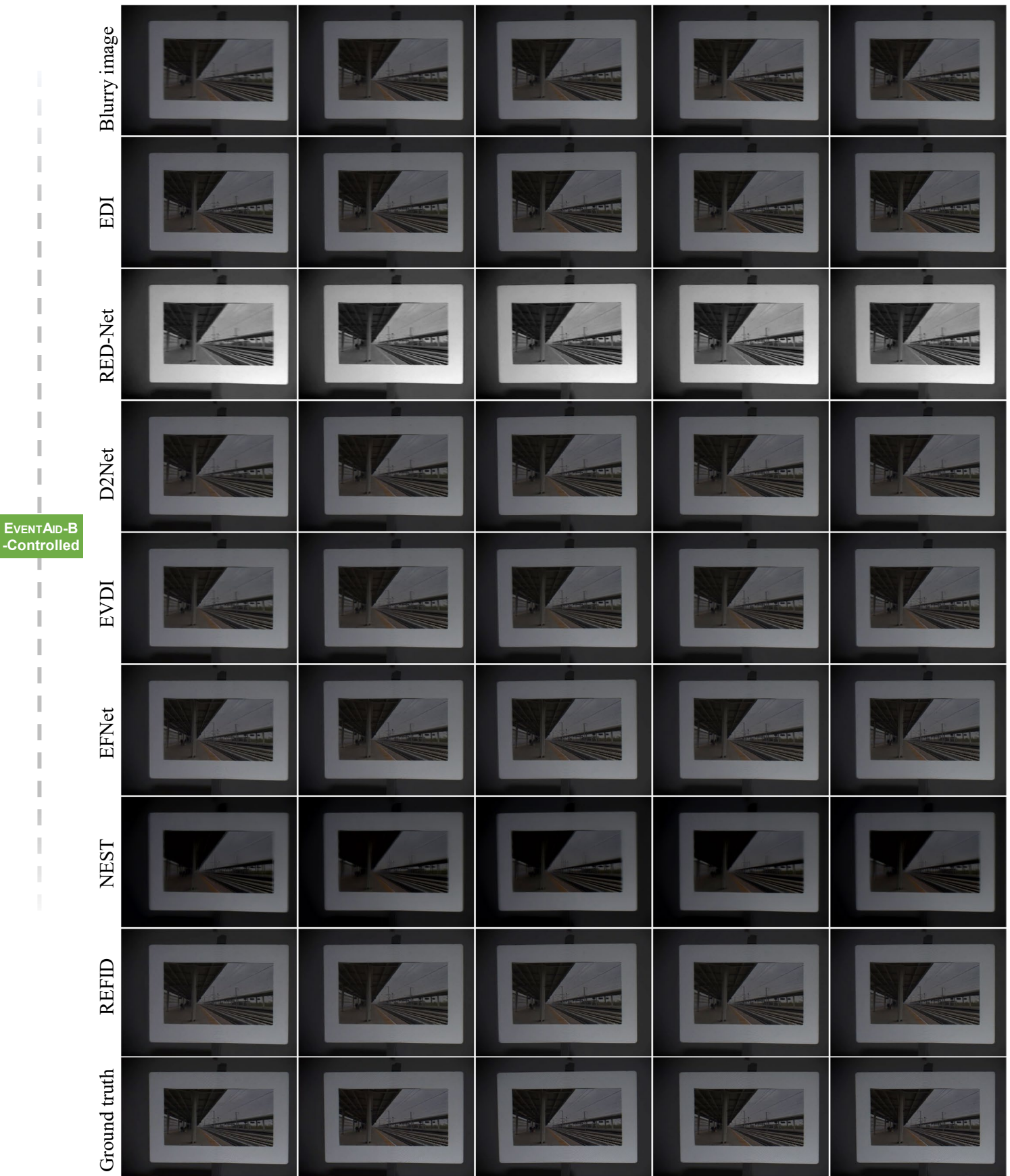


Figure S3-70: Comparison results of simulated EVENTAID-B-VM dataset (#14 B-XIAOYING)

3.4 Controlled experiment results for image deblurring



1500ms 1750ms 2000ms 2250ms 2500ms
 Figure S3-71: Deblurring results for different motion speed. The horizontal value indicates the rotation period of the picture plate. The lower the value, the more serious the motion blur.



2750ms 3000ms 3250ms 3500ms 3750ms
 Figure S3-72: Deblurring results for different motion speed. The horizontal value indicates the rotation period of the picture plate. The lower the value, the more serious the motion blur.

EVENTAID-B
-Controlled



Figure S3-73: Deblurring results for different motion speed. The horizontal value indicates the rotation period of the picture plate. The lower the value, the more serious the motion blur.

EVENTAID-B
-Controlled



Figure S3-74: Deblurring results for different motion speed. The horizontal value indicates the rotation period of the picture plate. The lower the value, the more serious the motion blur.

4 QUALITATIVE COMPARISON RESULTS: EVENT-AIDED IMAGE SUPER RESOLUTION

4.1 Results on real-captured EVENTAID-S dataset

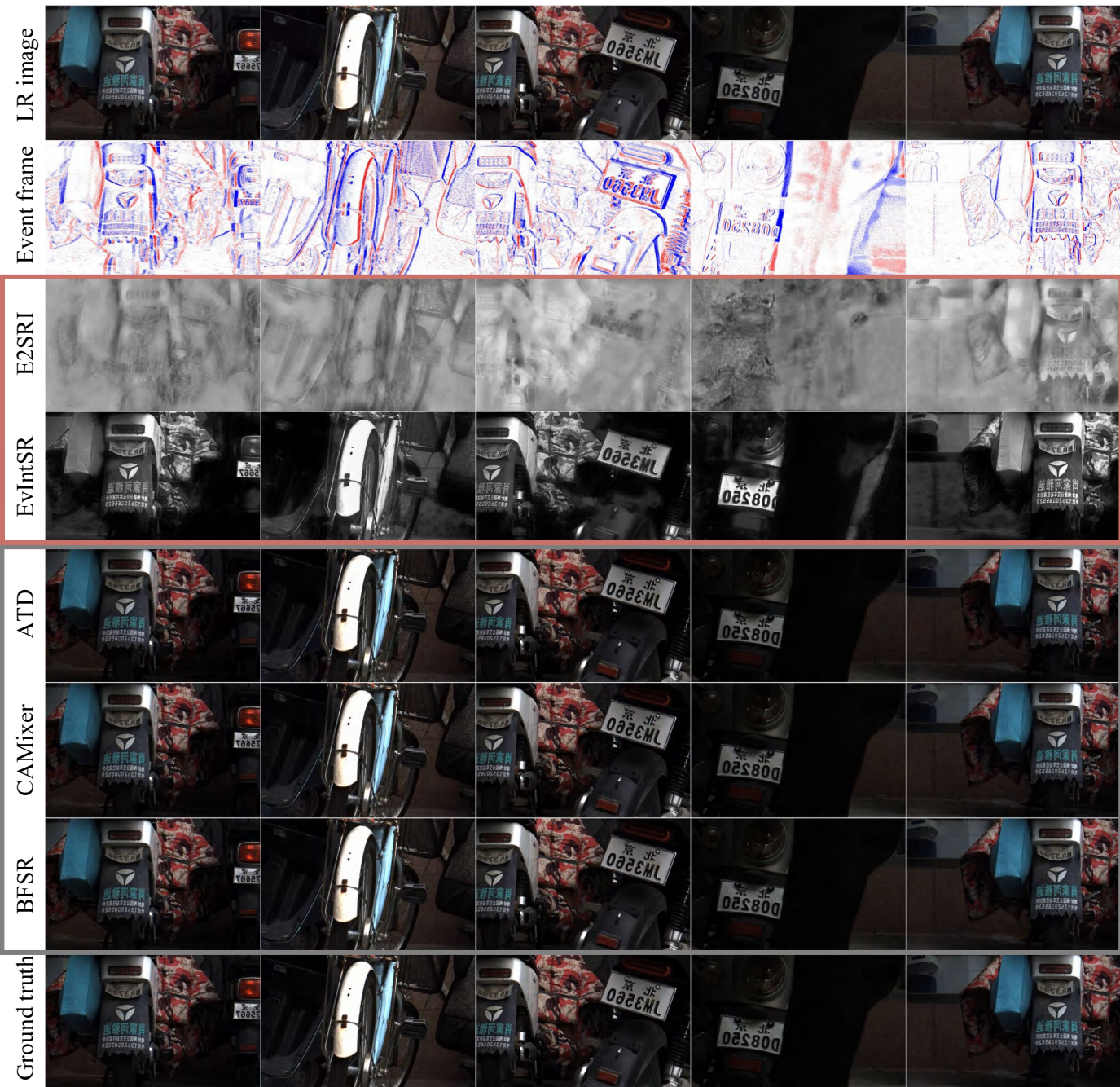
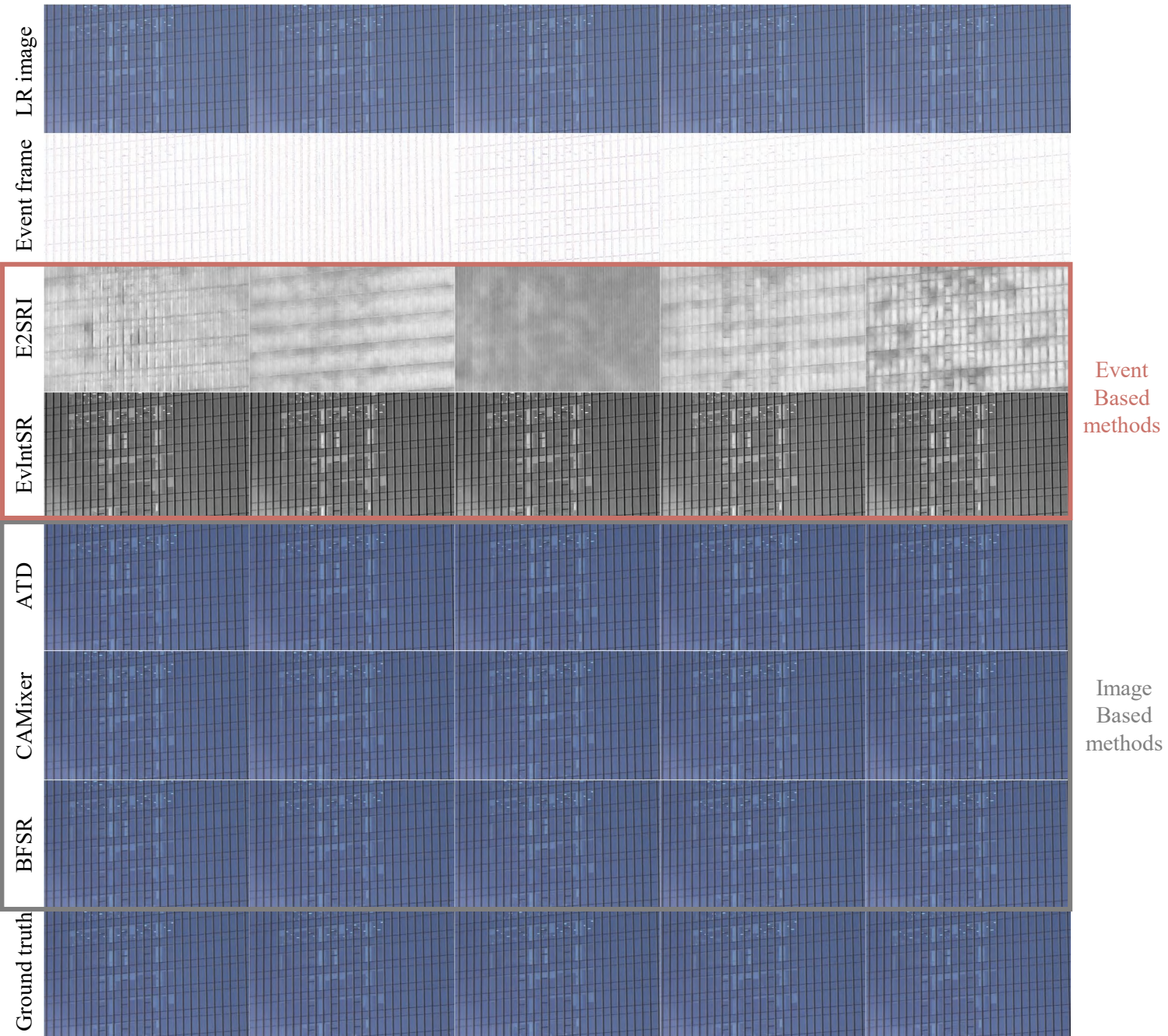


Figure S4-1: Comparison results of real-captured EVENTAID-S dataset (#1 S-BIKE)

EVENTAID-S



Event Based methods

Image Based methods

Figure S4-2: Comparison results of real-captured EVENTAID-S dataset (#2 S-BUILDING)

EVENTAID-S

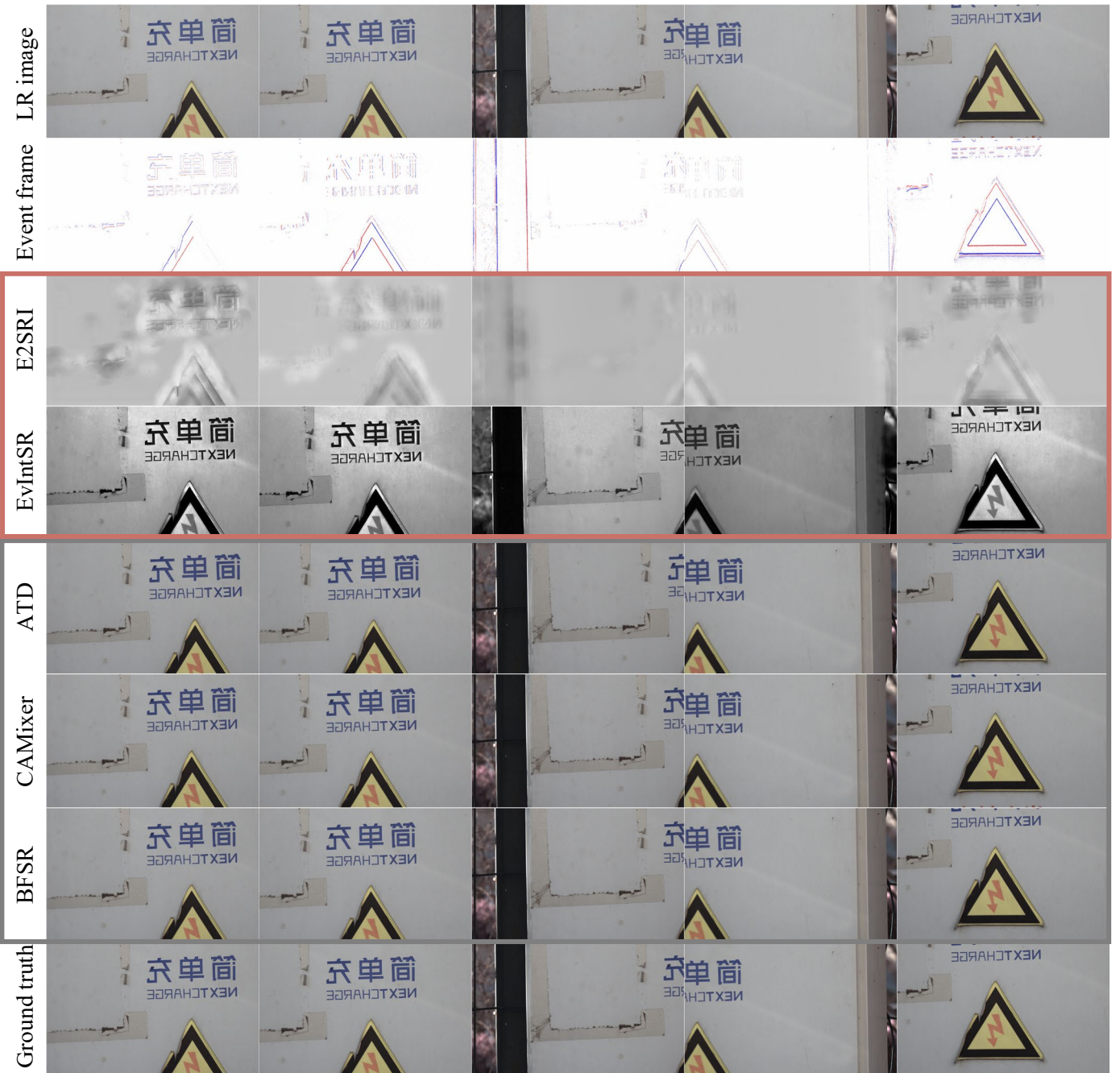


Event Based methods

Image Based methods

Figure S4-3: Comparison results of real-captured EVENTAID-S dataset (#3 S-CAR)

EVENTAID-S

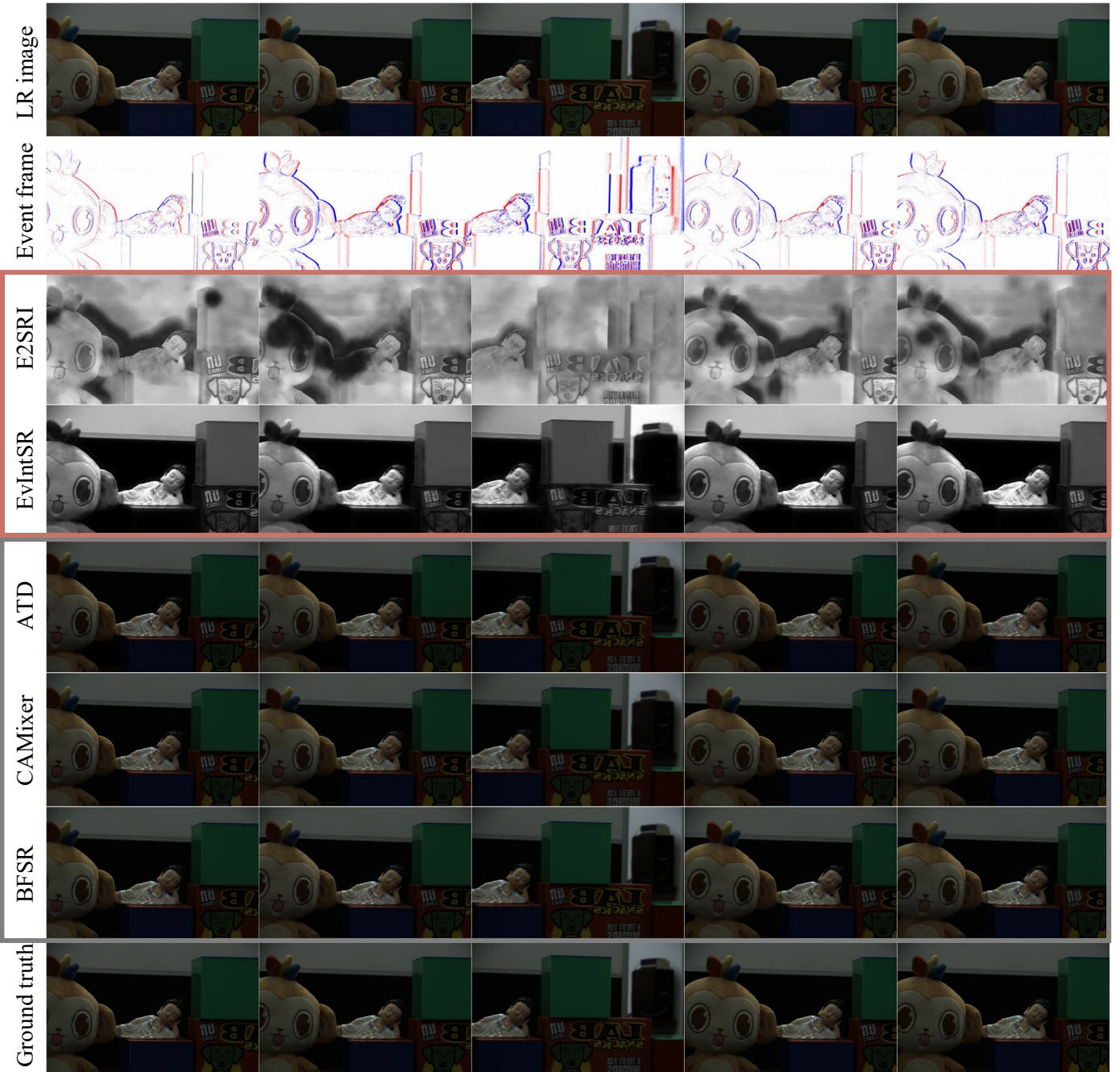


Event Based methods

Image Based methods

Figure S4-4: Comparison results of real-captured EVENTAID-S dataset (#4 S-CHARGE)

EVENTAID-S

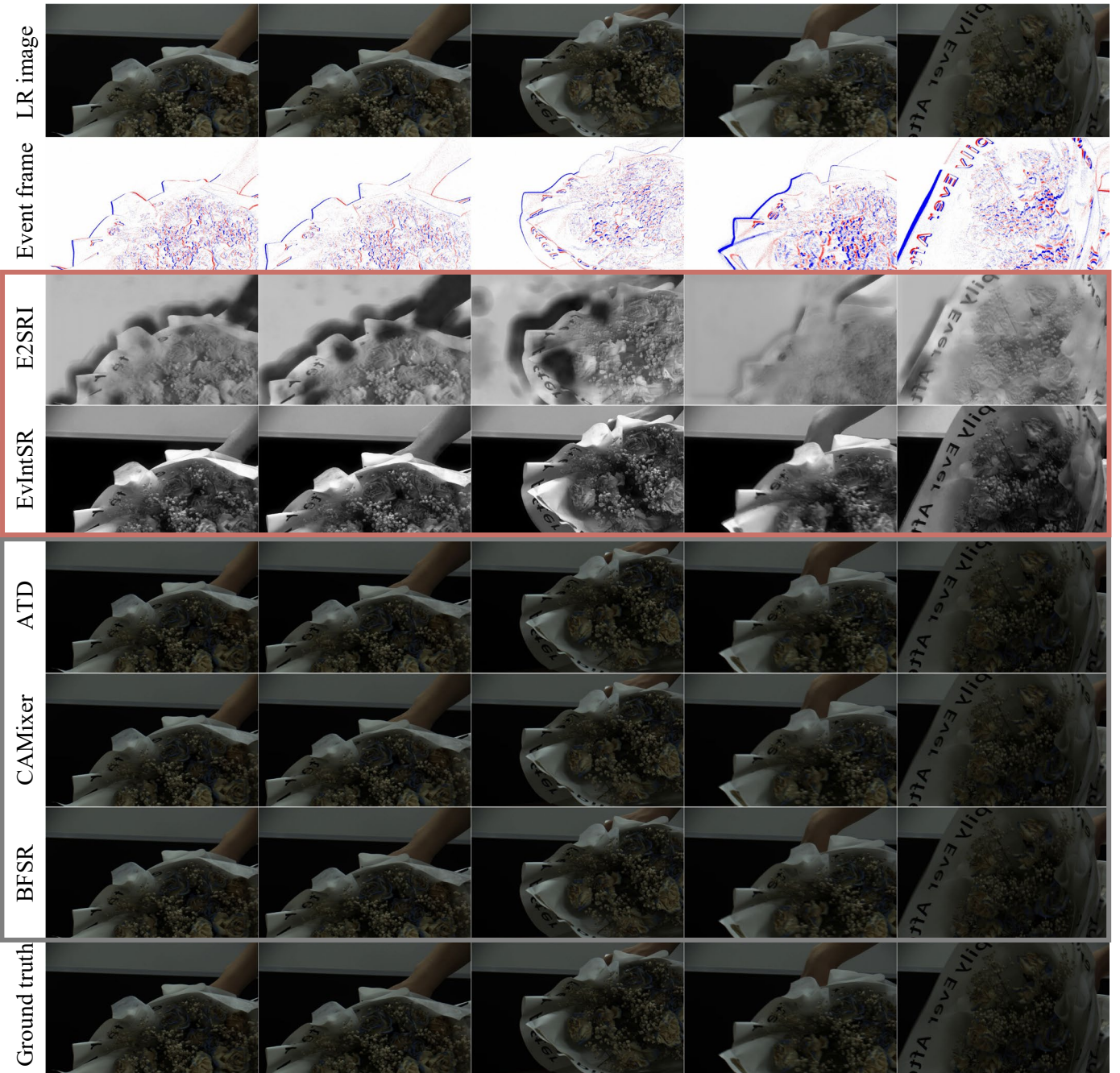


Event Based methods

Image Based methods

Figure S4-5: Comparison results of real-captured EVENTAID-S dataset (#5 S-DOLLS)

EVENTAID-S



Event Based methods

Image Based methods

Figure S4-6: Comparison results of real-captured EVENTAID-S dataset (#6 S-FLOWER)

EVENTAID-S



Event Based methods

Image Based methods

Figure S4-7: Comparison results of real-captured EVENTAID-S dataset (#7 S-PAPER)

EVENTAID-S

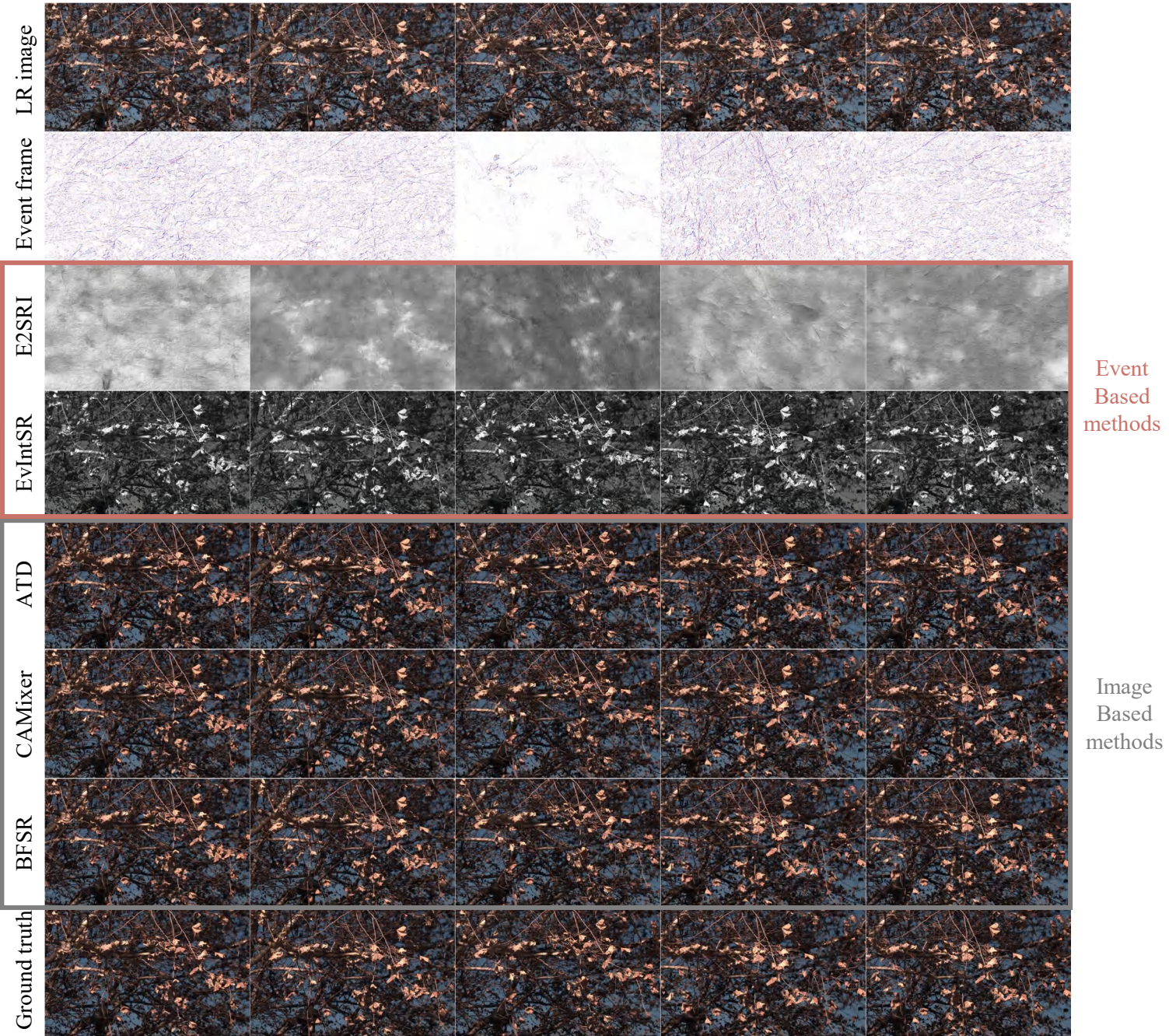


Figure S4-8: Comparison results of real-captured EVENTAID-S dataset (#8 S-TREE)

EVENTAID-S

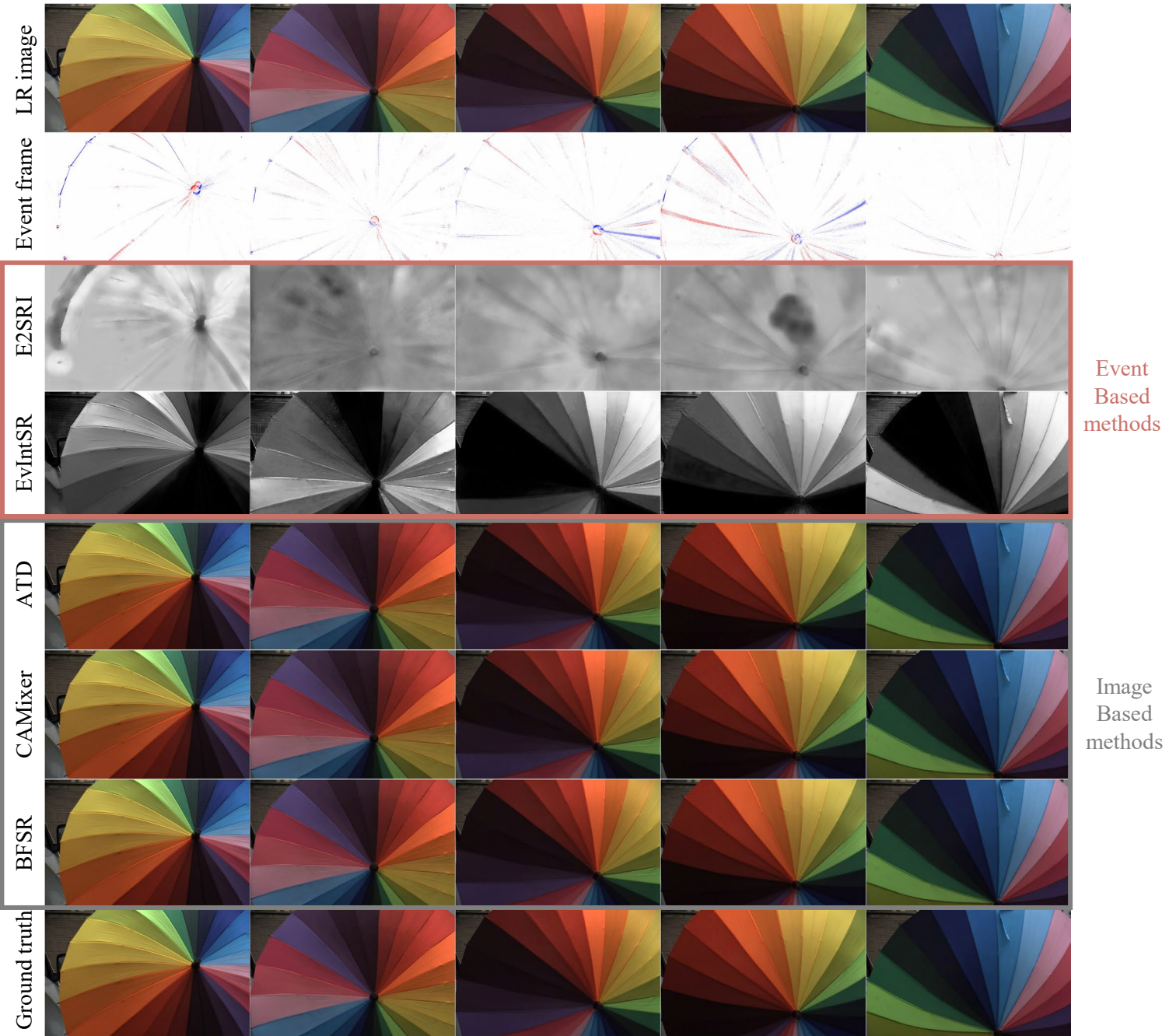


Figure S4-9: Comparison results of real-captured EVENTAID-S dataset (#9 S-UMBRELLA)

EVENTAID-S

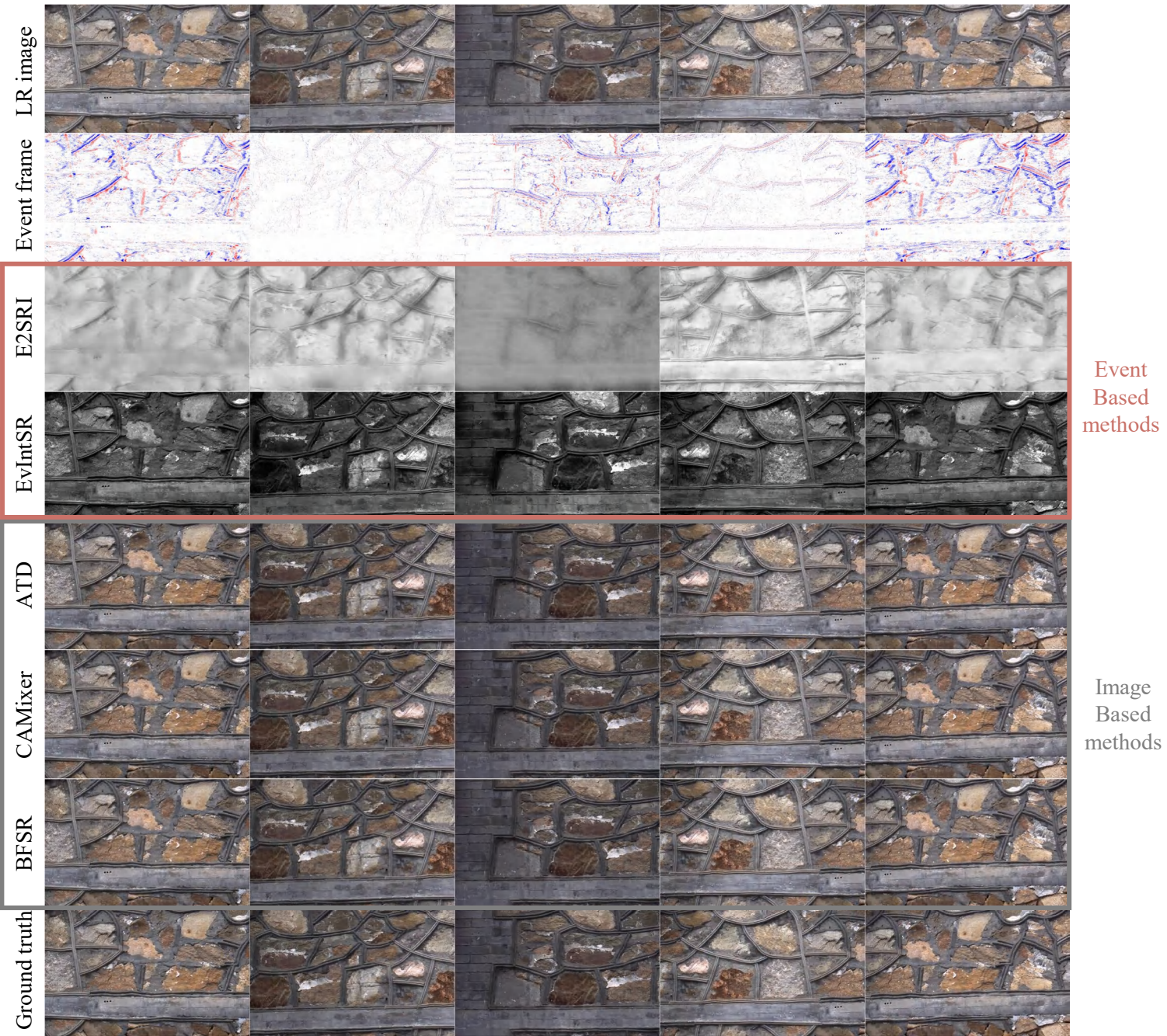


Figure S4-10: Comparison results of real-captured EVENTAID-S dataset (#10 S-WALL)

4.2 Results on simulated EVENTAID-S-V2E dataset



Figure S4-11: Comparison results of simulated EVENTAID-S-V2E dataset (#1 S-BIKE)

EVENTAID-S-V2E

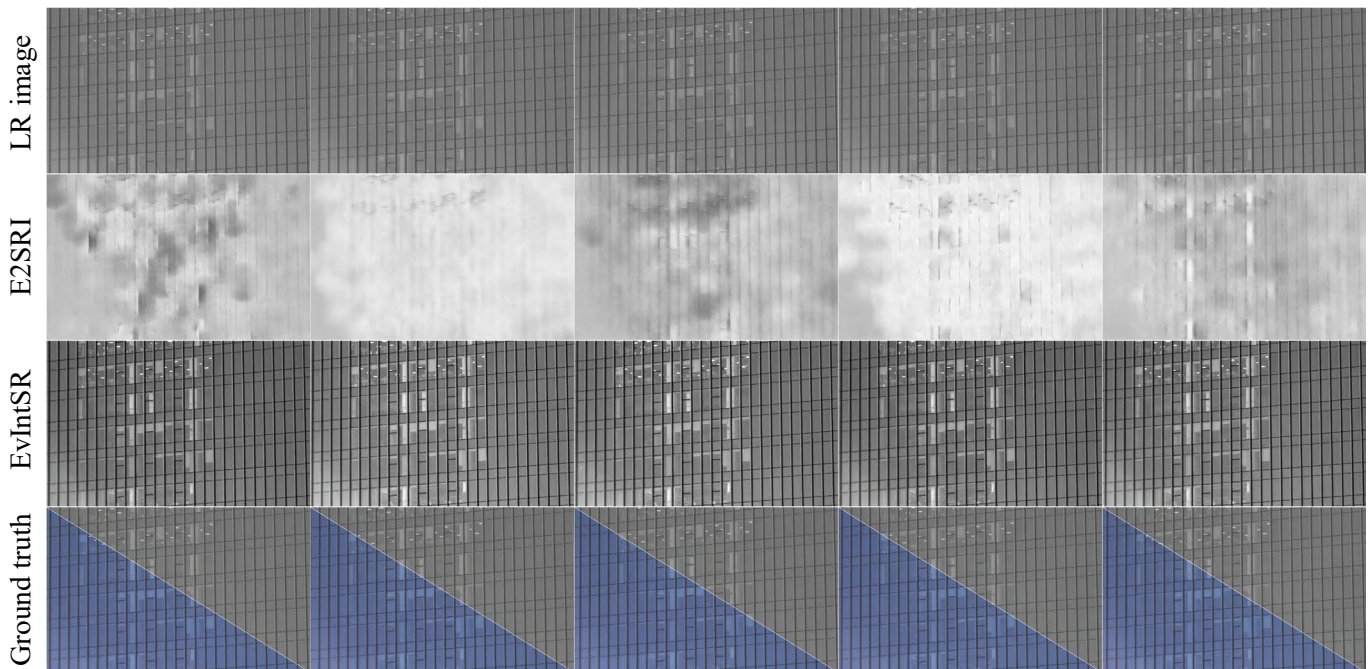


Figure S4-12 : Comparison results of simulated EVENTAID-S-V2E dataset (#2 S-BUILDING)

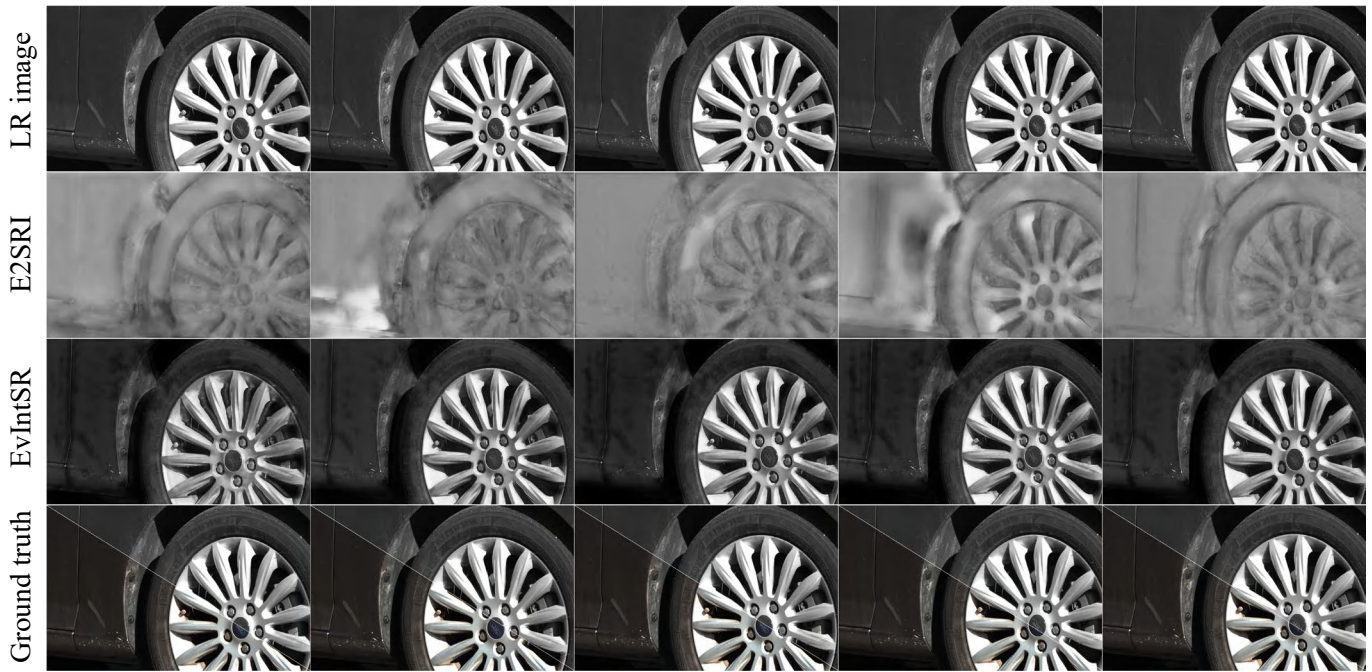


Figure S4-13: Comparison results of simulated EVENTAID-S-V2E dataset (#3 S-CAR)

EVENTAID-S-V2E



Figure S4-14: Comparison results of simulated EVENTAID-S-V2E dataset (#4 S-CHARGE)

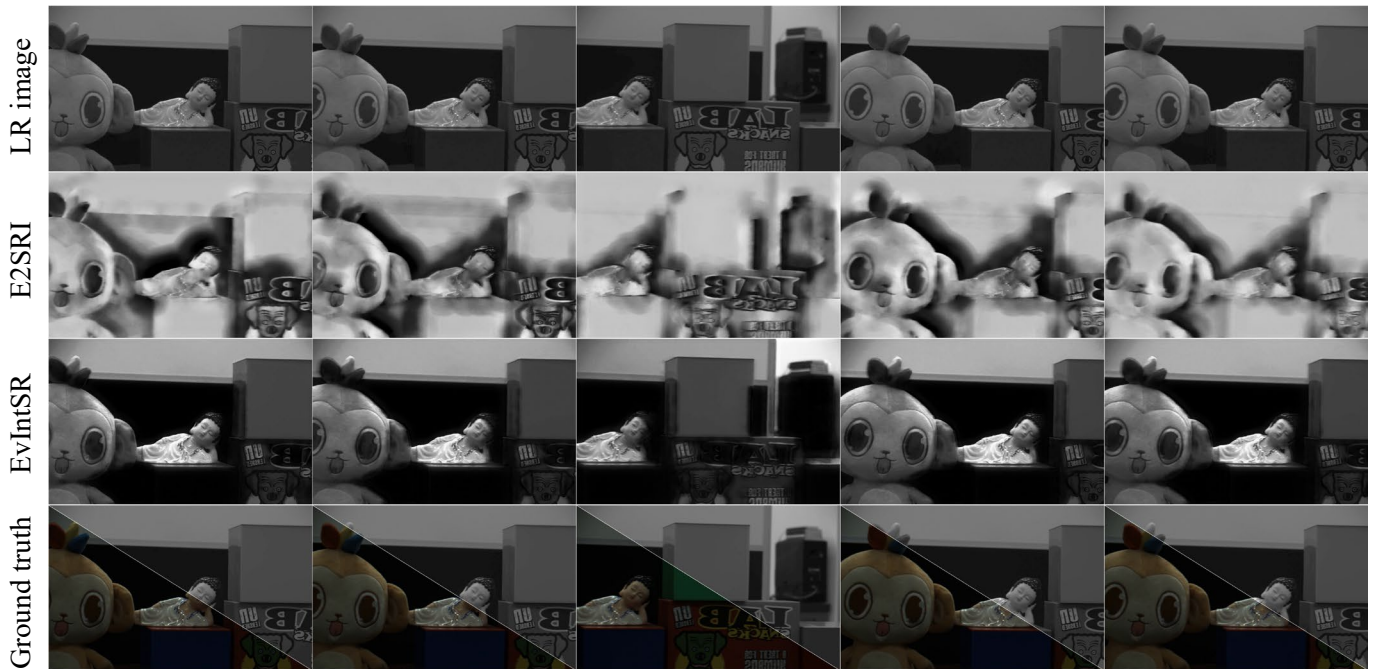


Figure S4-15: Comparison results of simulated EVENTAID-S-V2E dataset (#5 S-DOLLS)

EVENTAID-S
-V2E

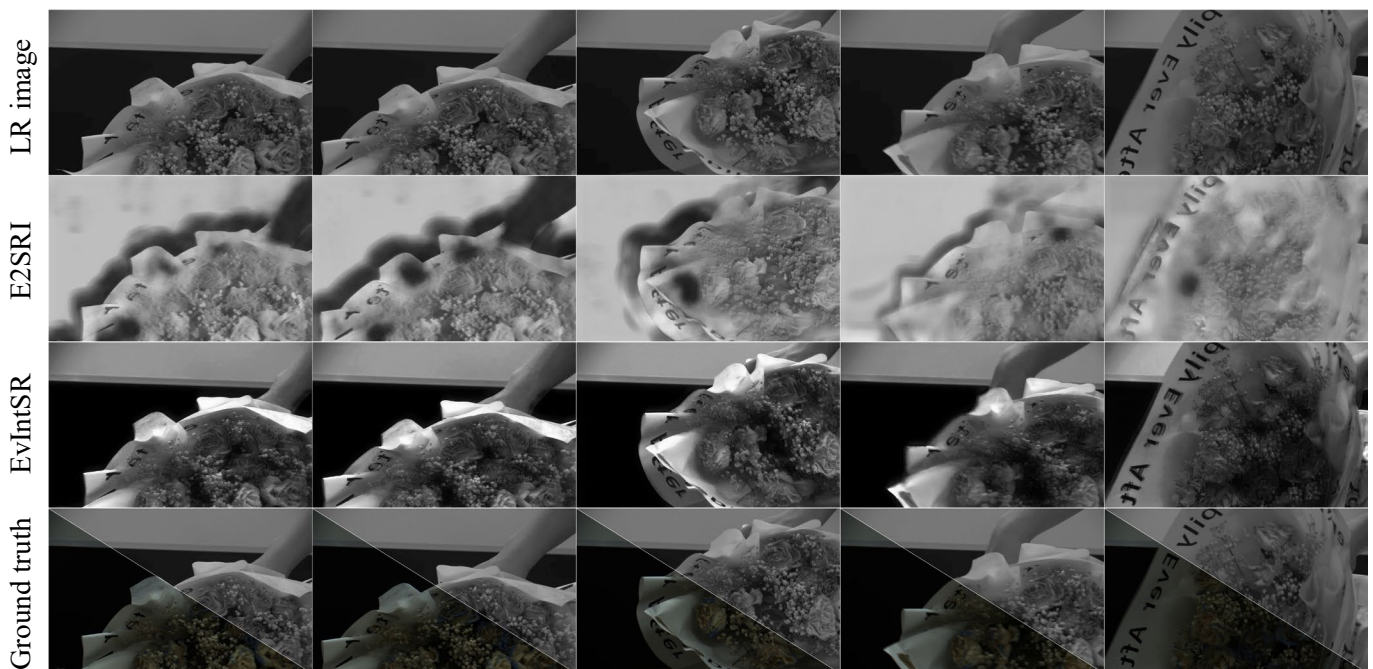


Figure S4-16: Comparison results of simulated EVENTAID-S-V2E dataset (#6 S-FLOWER)

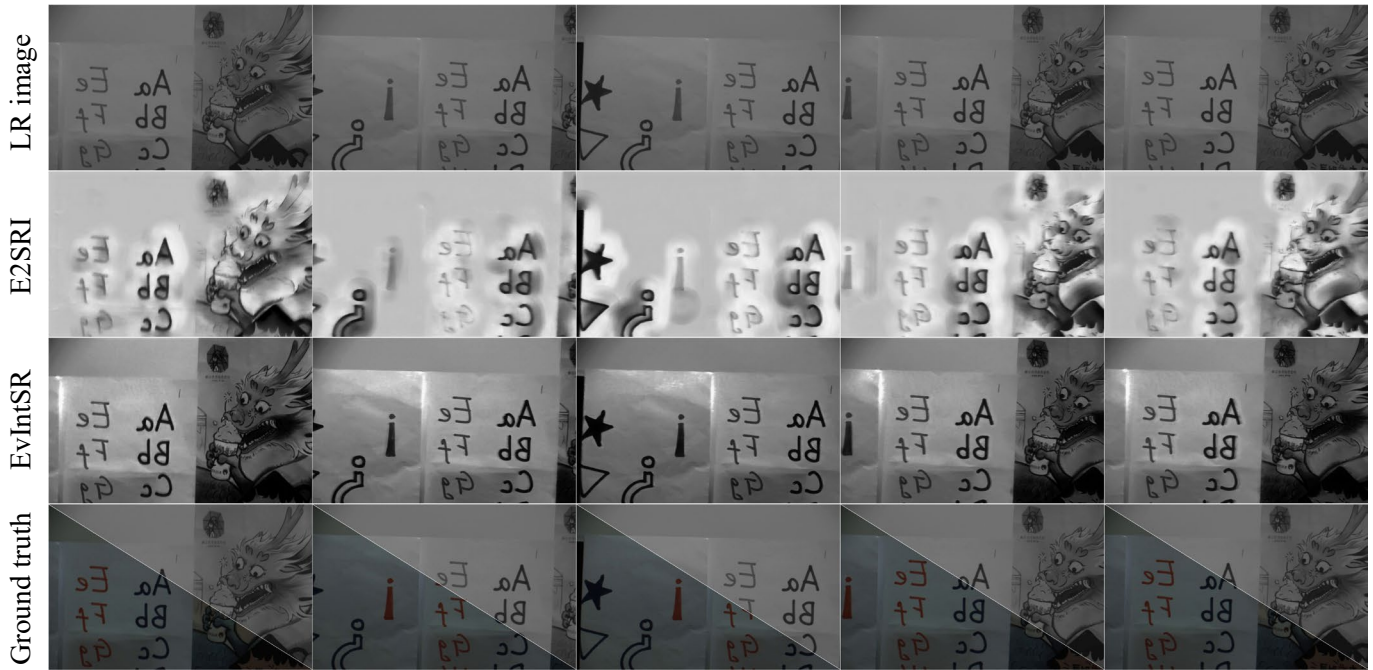


Figure S4-17: Comparison results of simulated EVENTAID-S-V2E dataset (#7 S-PAPER)

EVENTAID-S
-V2E

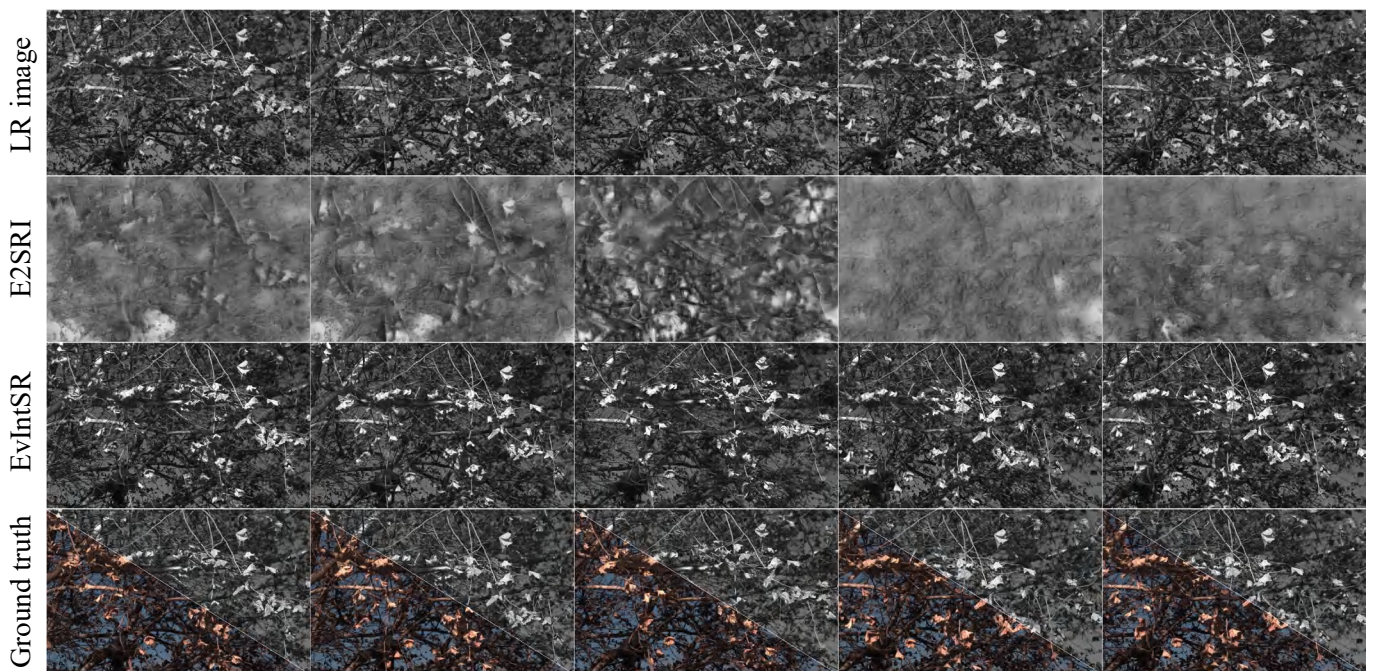


Figure S4-18: Comparison results of simulated EVENTAID-S-V2E dataset (#8 S-TREE)

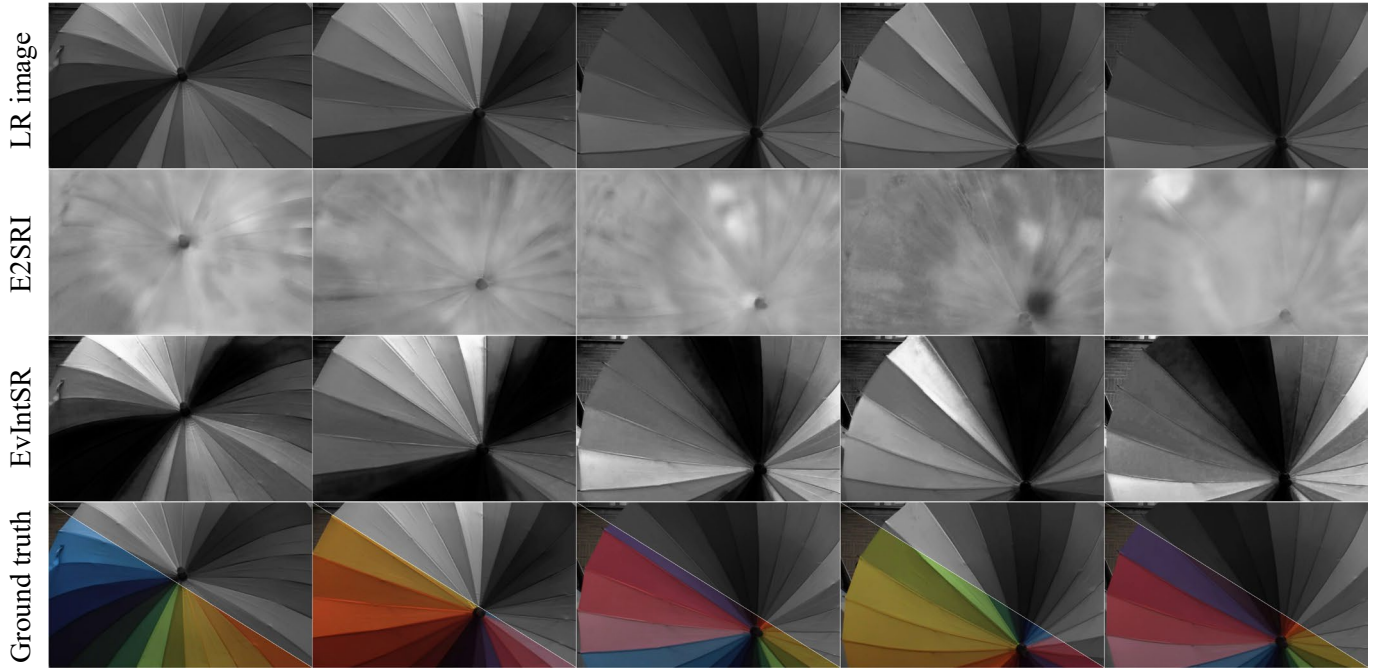


Figure S4-19: Comparison results of simulated EVENTAID-S-V2E dataset (#9 S-UMBRELLA)

EVENTAID-S
-V2E

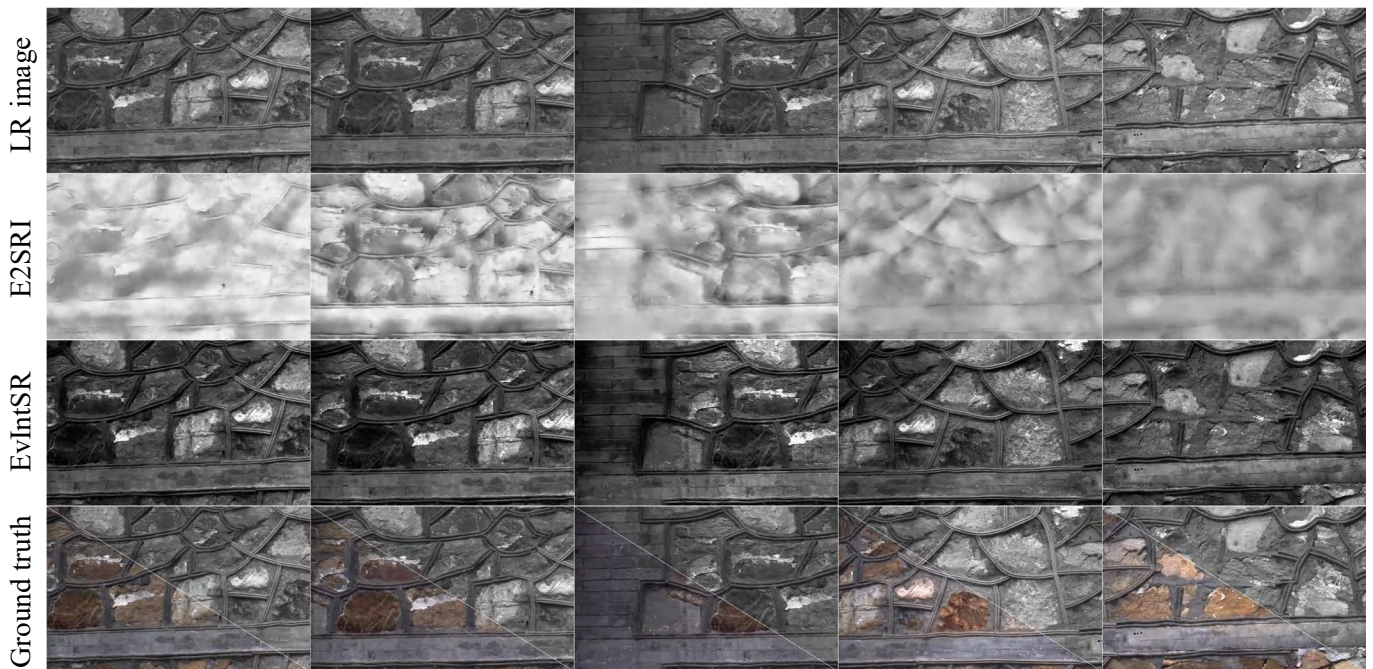


Figure S4-20: Comparison results of simulated EVENTAID-S-V2E dataset (#10 S-WALL)

4.3 Results on simulated EVENTAID-S-VM dataset



Figure S4-21: Comparison results of simulated EVENTAID-S-VM dataset (#1 S-BIKE)

EVENTAID-S-VM

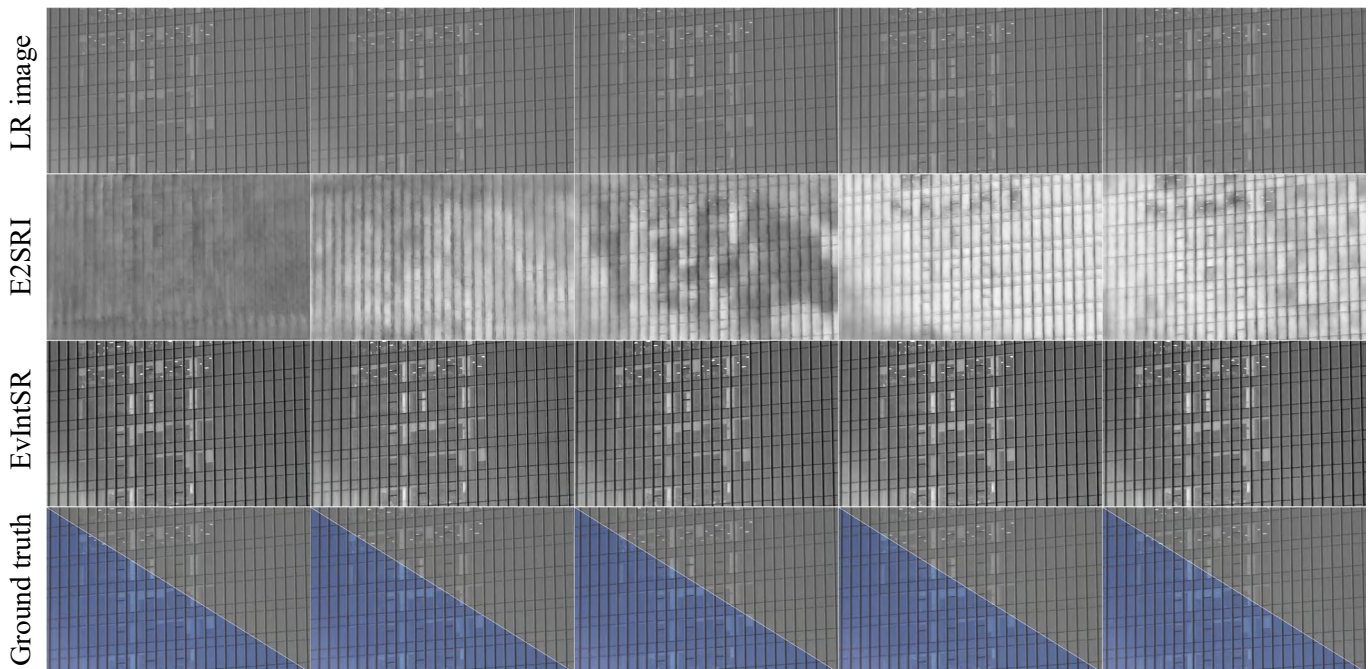


Figure S4-22: Comparison results of simulated EVENTAID-S-VM dataset (#2 S-BUILDING)

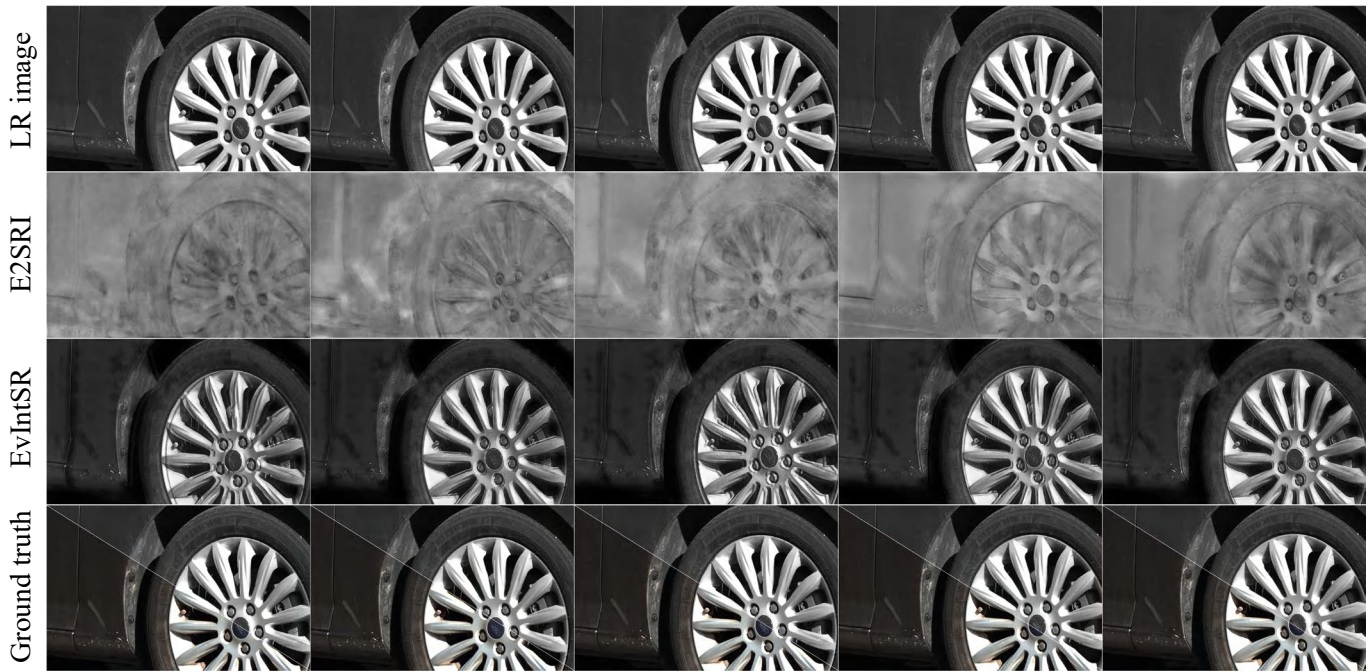


Figure S4-23: Comparison results of simulated EVENTAID-S-VM dataset (#3 S-CAR)

EVENTAID-S-VM



Figure S4-24: Comparison results of simulated EVENTAID-S-VM dataset (#4 S-CHARGE)

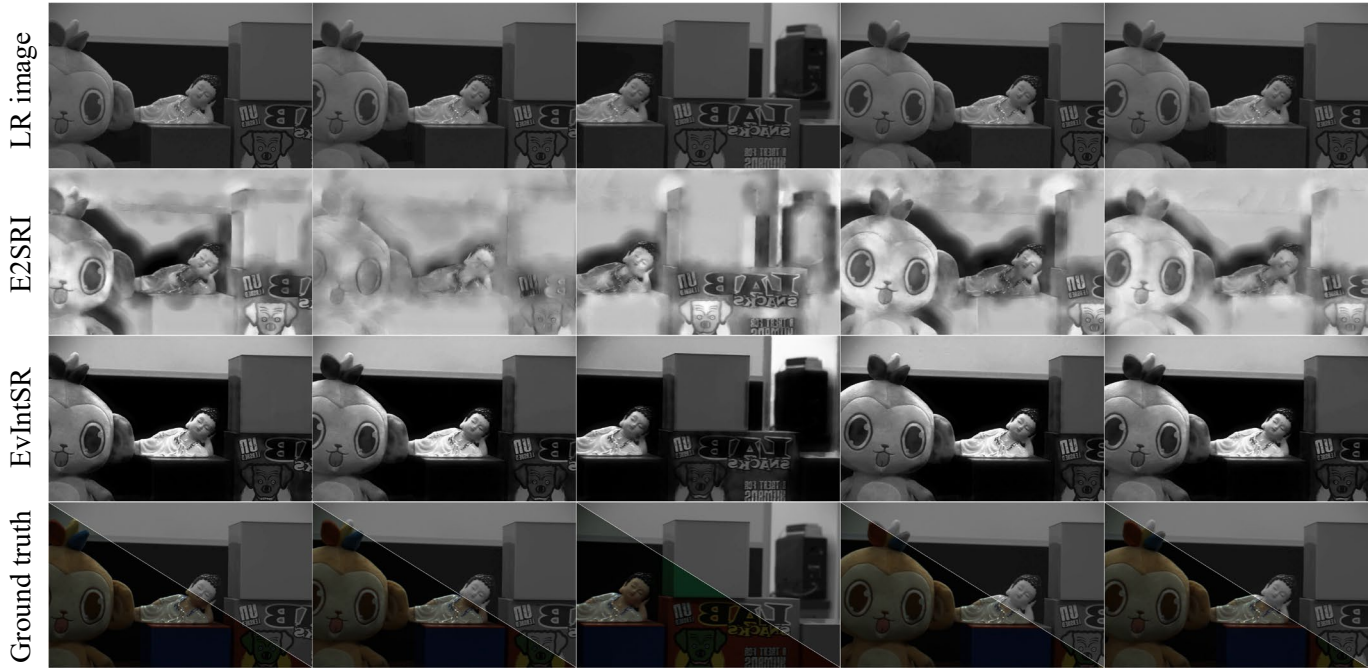


Figure S4-25: Comparison results of simulated EVENTAID-S-VM dataset (#5 S-DOLLS)

EVENTAID-S-VM

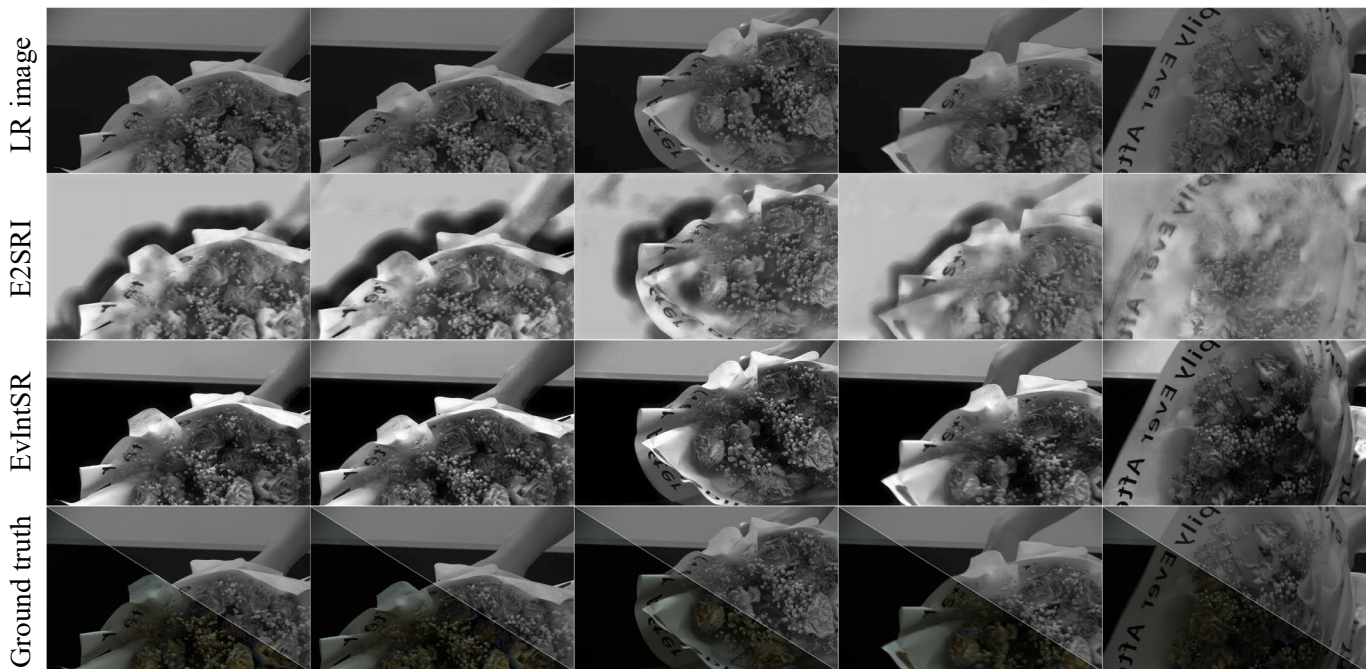


Figure S4-26: Comparison results of simulated EVENTAID-S-VM dataset (#6 S-FLOWER)

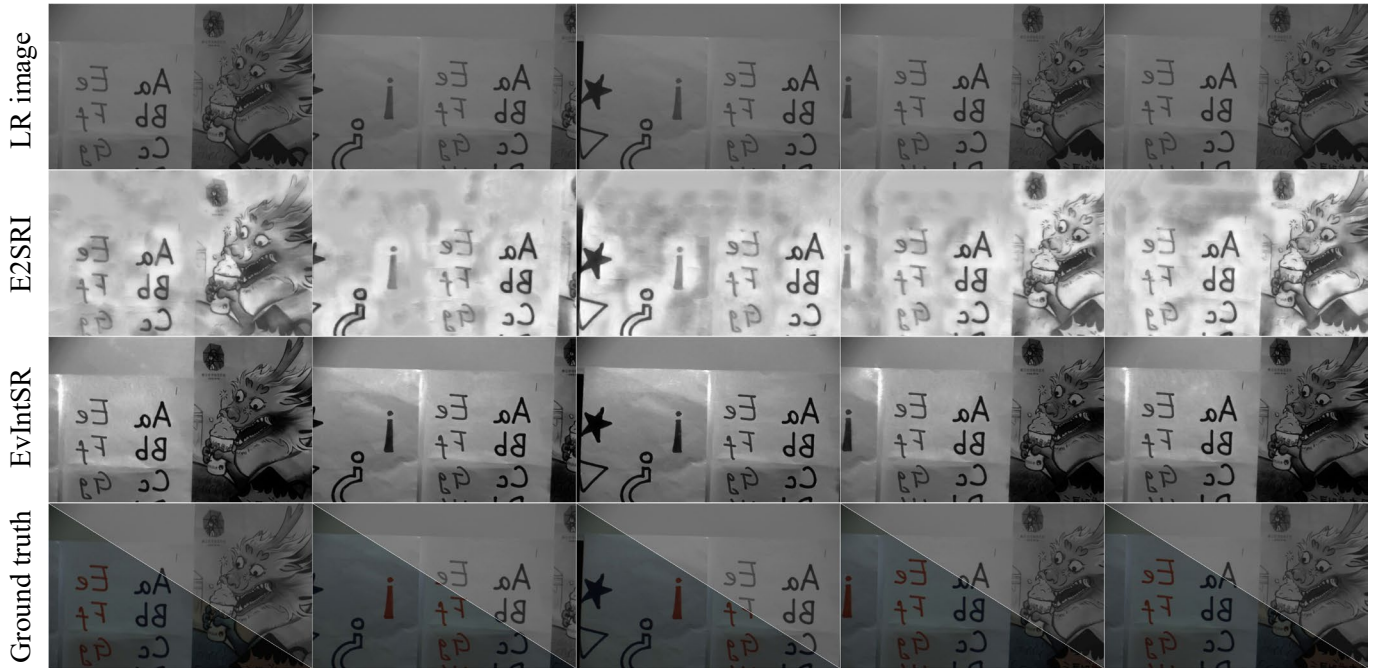


Figure S4-27: Comparison results of simulated EVENTAID-S-VM dataset (#7 S-PAPER)

EVENTAID-S-VM

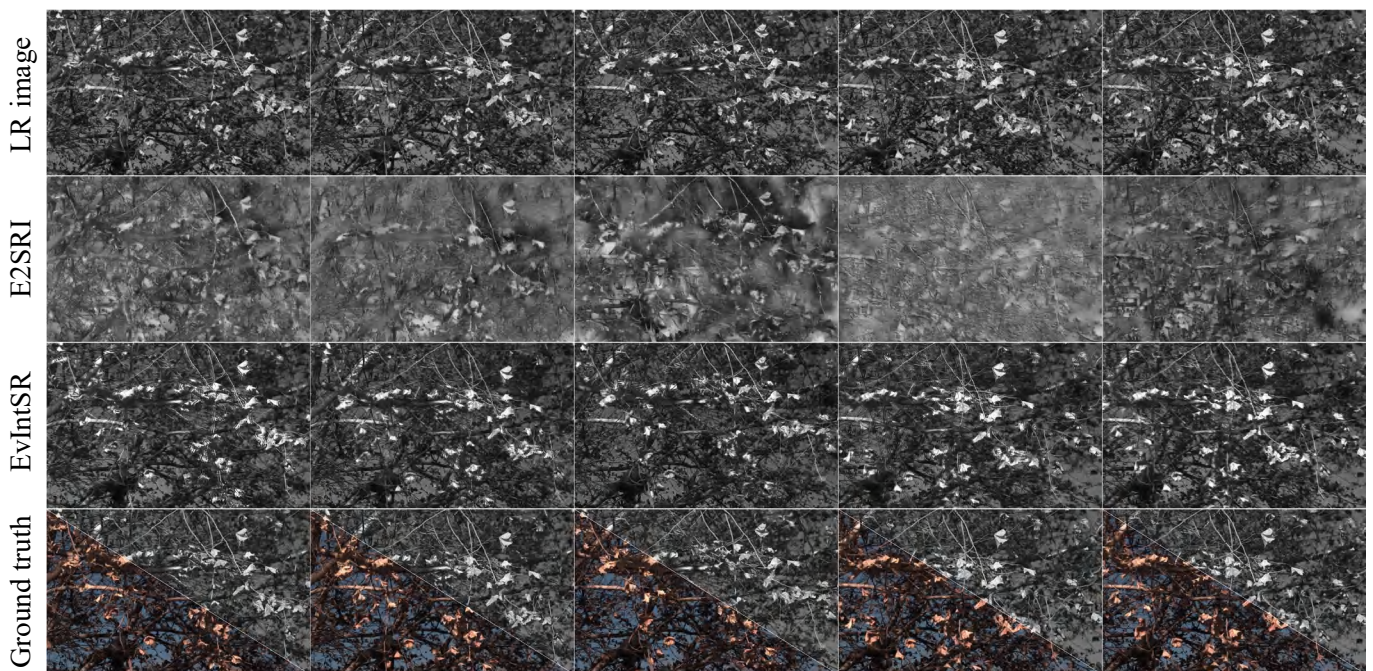


Figure S4-28: Comparison results of simulated EVENTAID-S-VM dataset (#8 S-TREE)

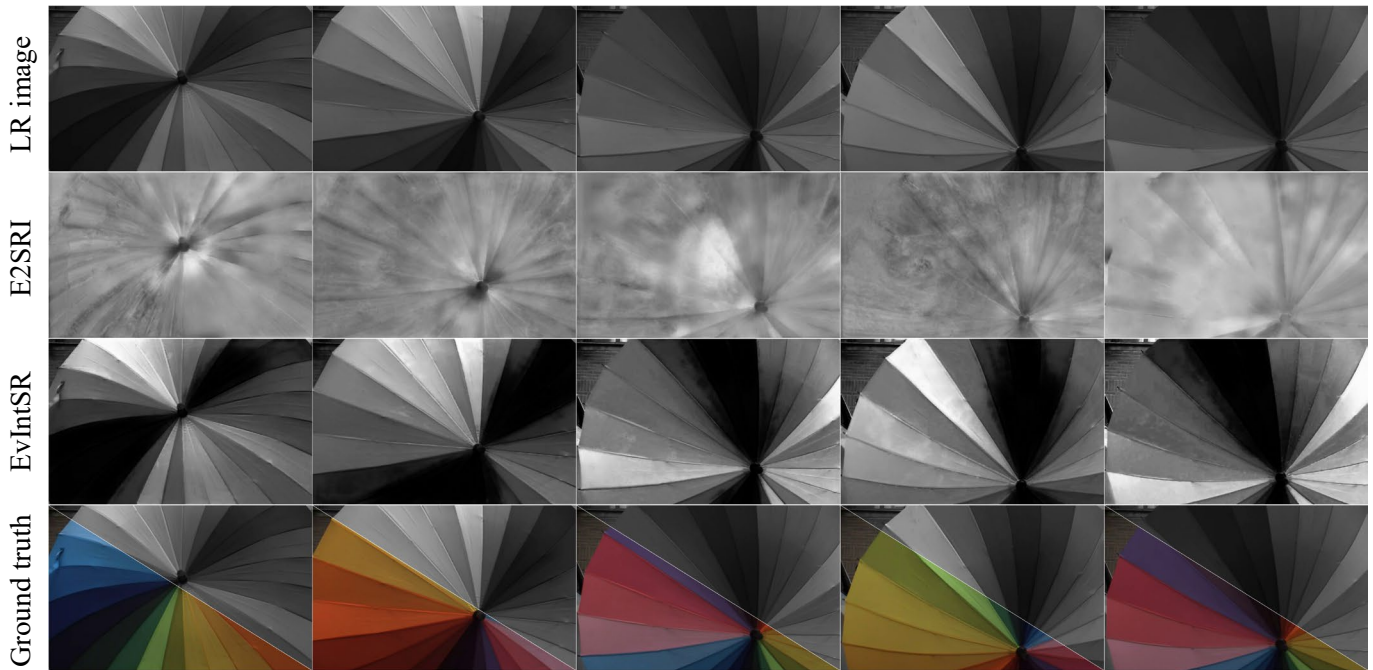


Figure S4-29: Comparison results of simulated EVENTAID-S-VM dataset (#9 S-UMBRELLA)

EVENTAID-S-VM

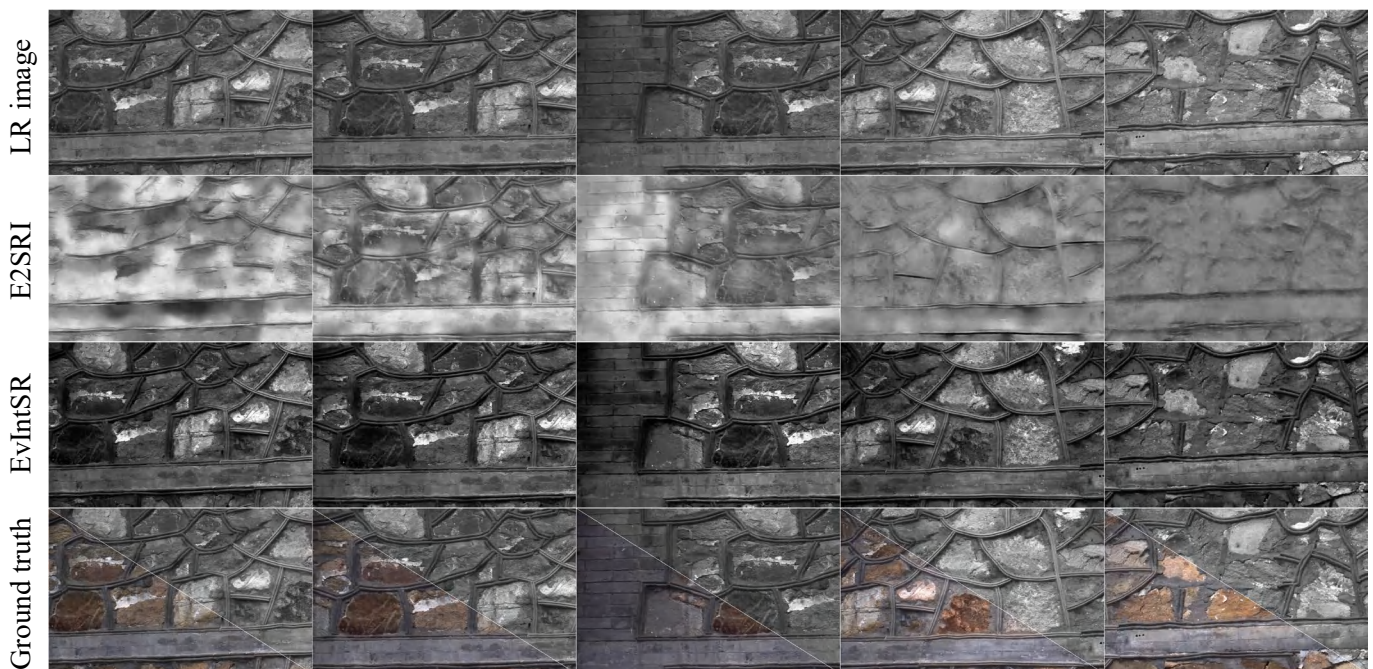


Figure S4-30: Comparison results of simulated EVENTAID-S-VM dataset (#10 S-WALL)

5 QUALITATIVE COMPARISON RESULTS: EVENT-AIDED HIGH DYNAMIC RANGE IMAGE

5.1 Results on real-captured EVENTAID-D-Static dataset



Figure S5-1: HDR reference of EVENTAID-D-Static dataset (#1 D-CAR)

EVENTAID-D-Static

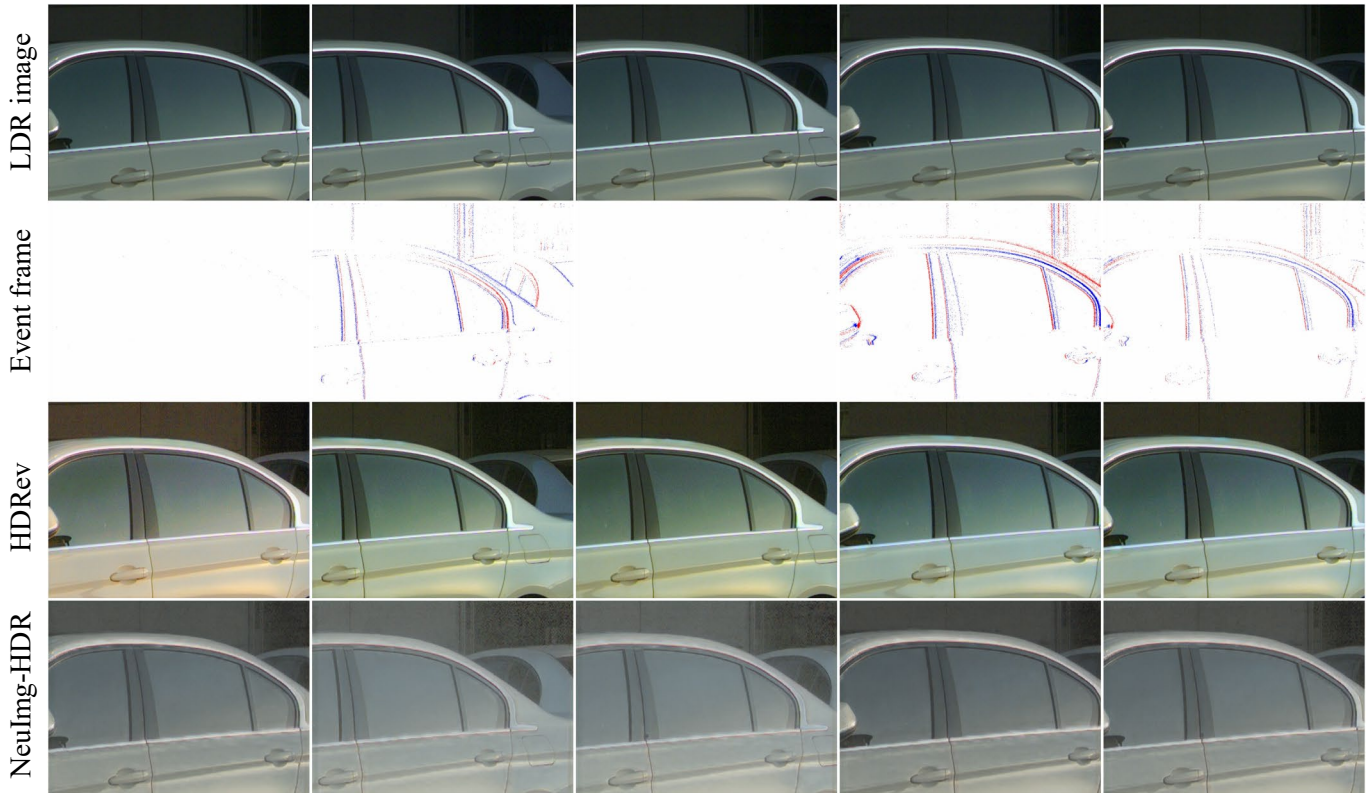


Figure S5-2: Comparison results of real-captured EVENTAID-D-Static dataset (#1 D-CAR, short-exposure)



Figure S5-3: Comparison results of real-captured EVENTAID-D-Static dataset (#1 D-CAR, middle-exposure)

EVENTAID-D-Static

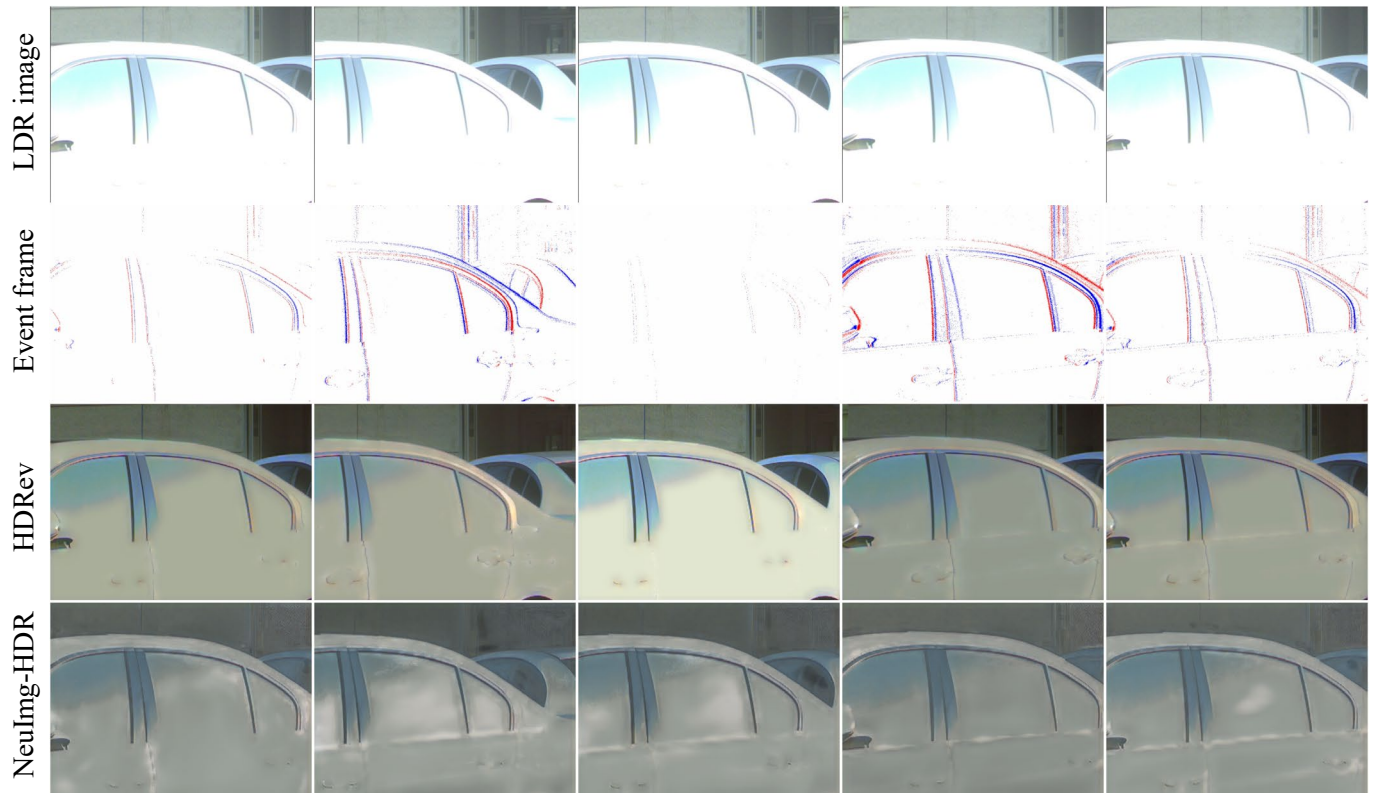


Figure S5-4: Comparison results of real-captured EVENTAID-D-Static dataset (#1 D-CAR, long-exposure)



Figure S5-5: HDR reference of EVENTAID-D-Static dataset (#2 D-TRICYCLE)

EVENTAID-D-Static

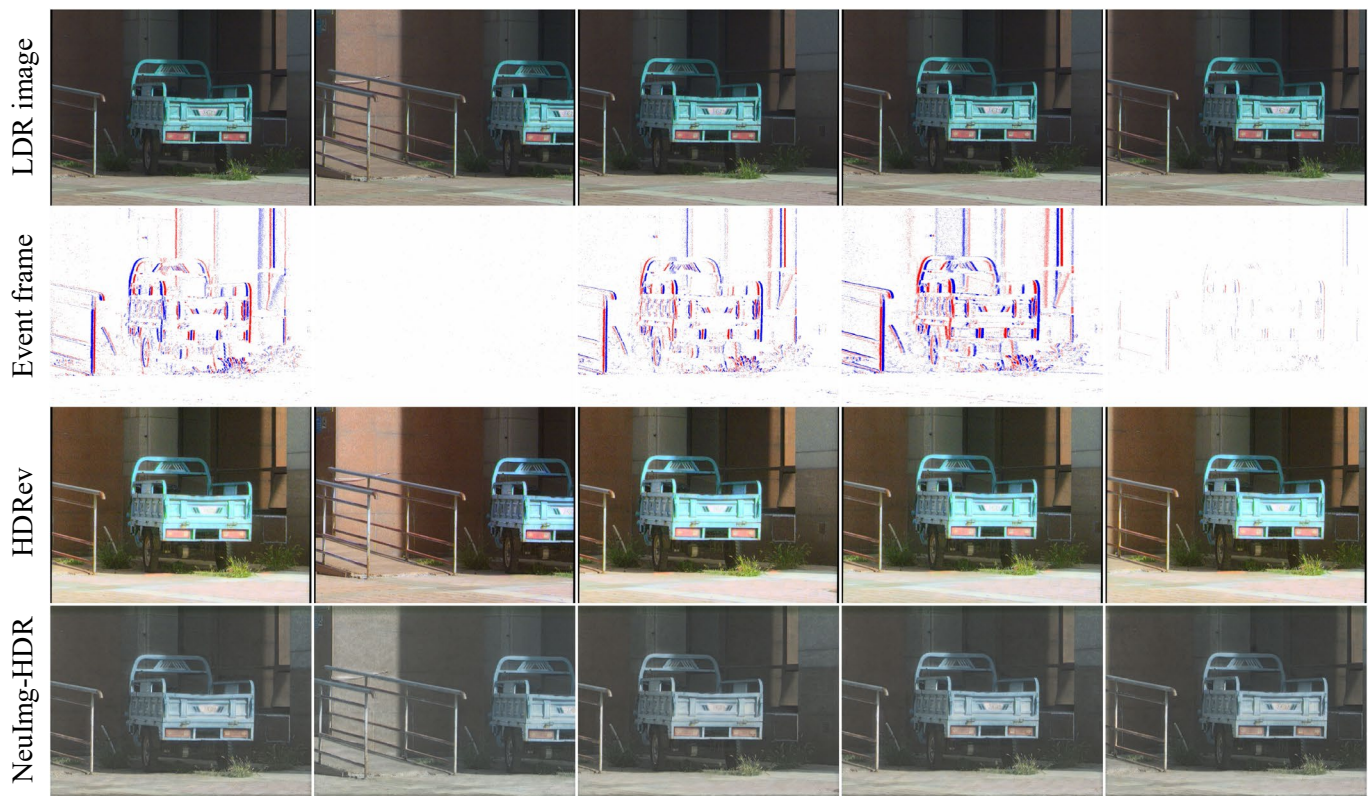


Figure S5-6: Comparison results of real-captured EVENTAID-D-Static dataset (#2 D-TRICYCLE, short-exposure)

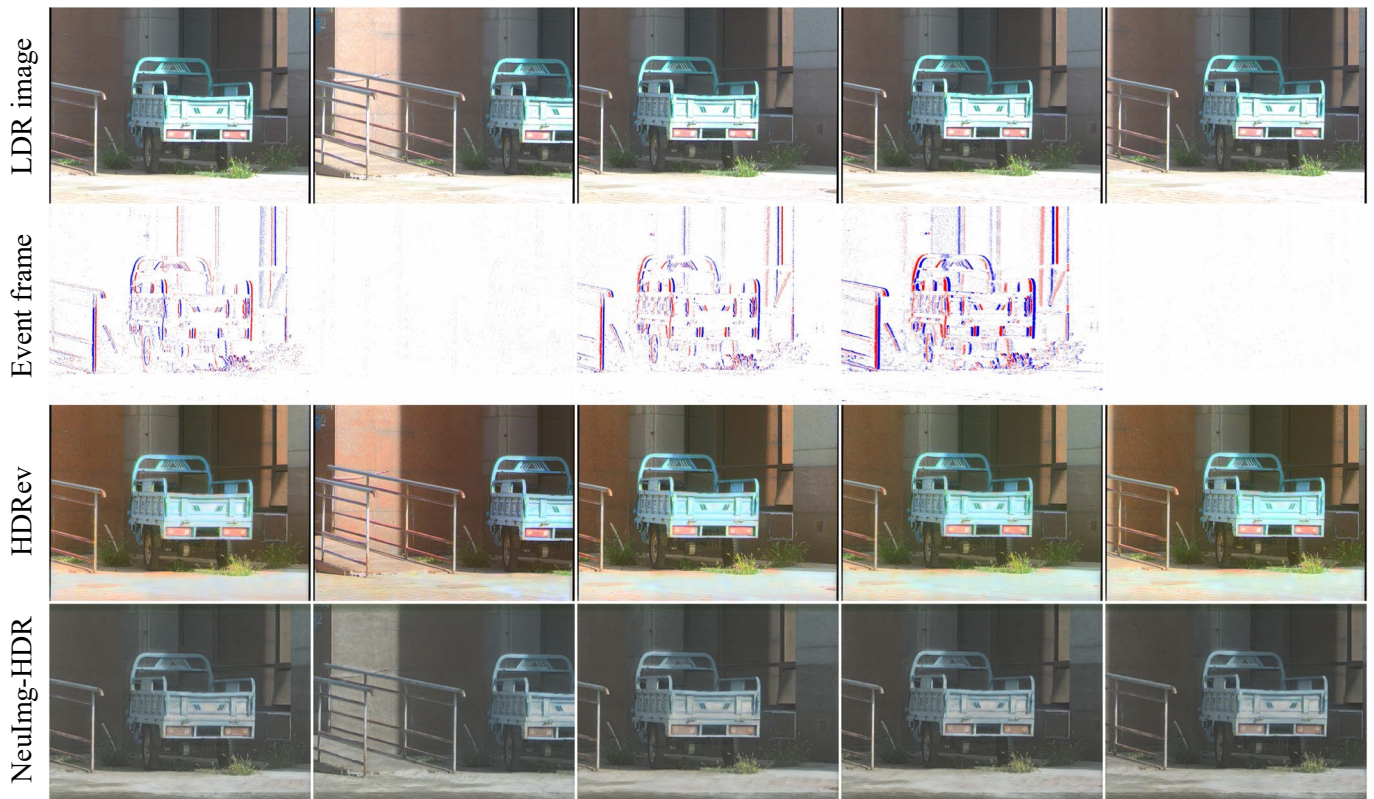


Figure S5-7: Comparison results of real-captured EVENTAID-D-Static dataset (#2 D-TRICYCLE, middle-exposure)

EVENTAID-D-Static

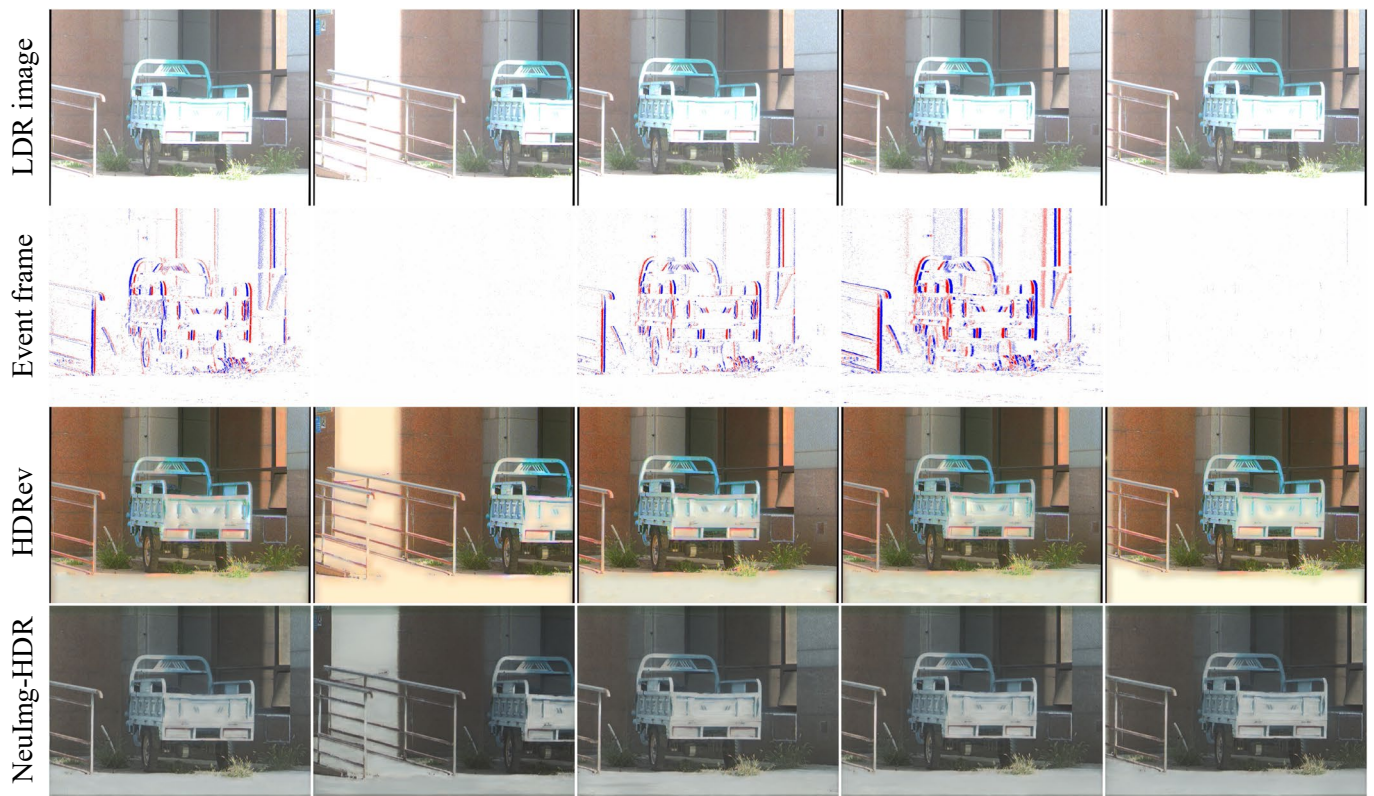


Figure S5-8: Comparison results of real-captured EVENTAID-D-Static dataset (#2 D-TRICYCLE, long-exposure)



Figure S5-9: HDR reference of EVENTAID-D-Static dataset (#3 D-DISPLAY)

EVENTAID-D-Static

LDR image
Event frame
HDRrev
NeuImg-HDR

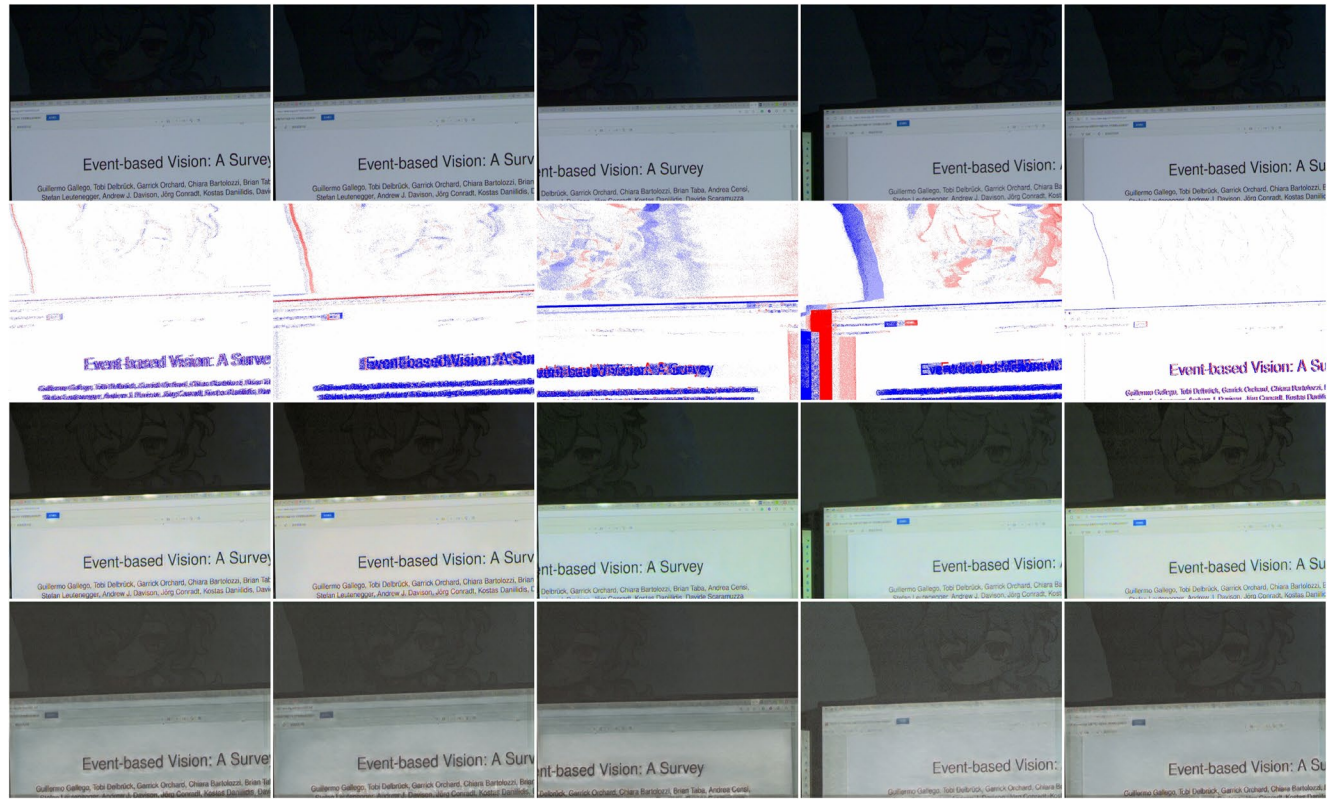


Figure S5-10: Comparison results of real-captured EVENTAID-D-Static dataset (#3 D-DISPLAY, short-exposure)

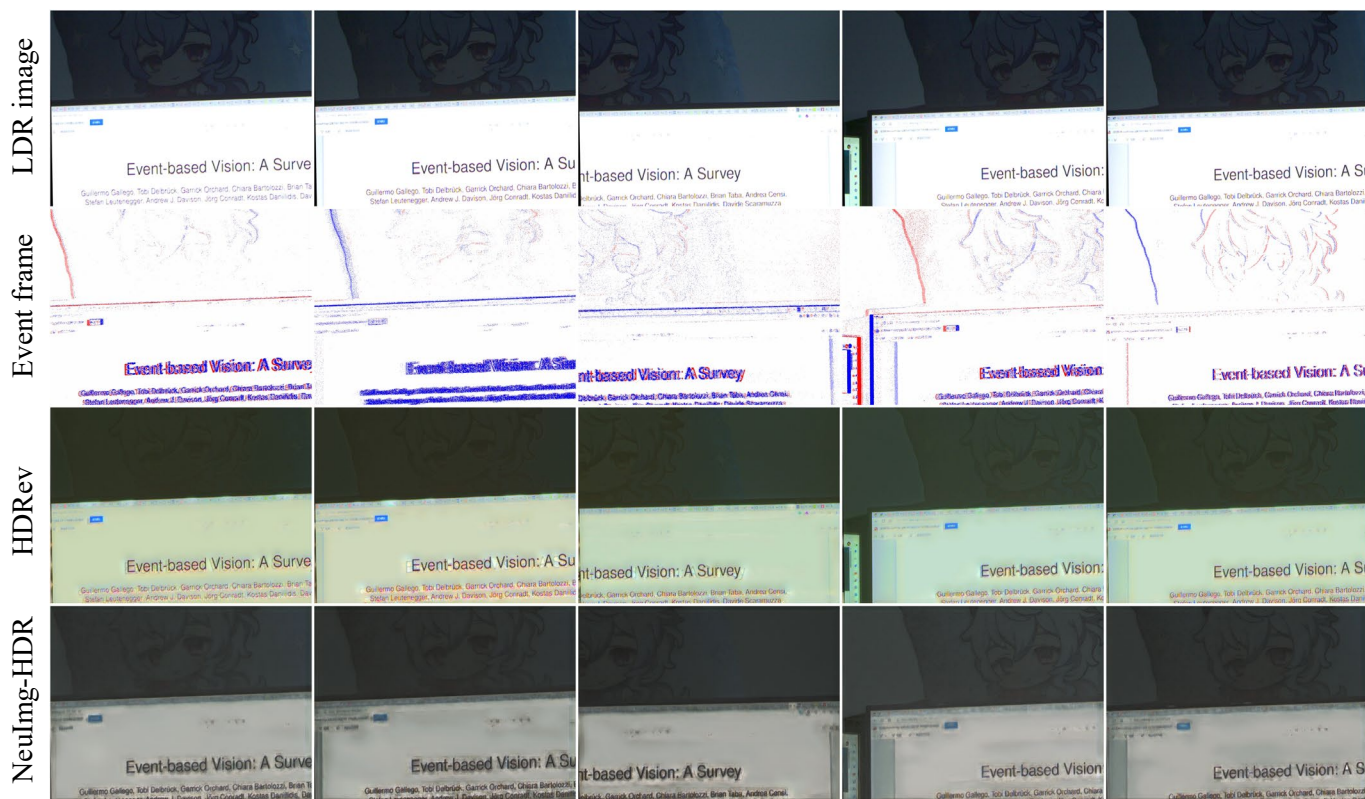


Figure S5-11: Comparison results of real-captured EVENTAID-D-Static dataset (#3 D-DISPLAY, middle-exposure)

EVENTAID-D-Static

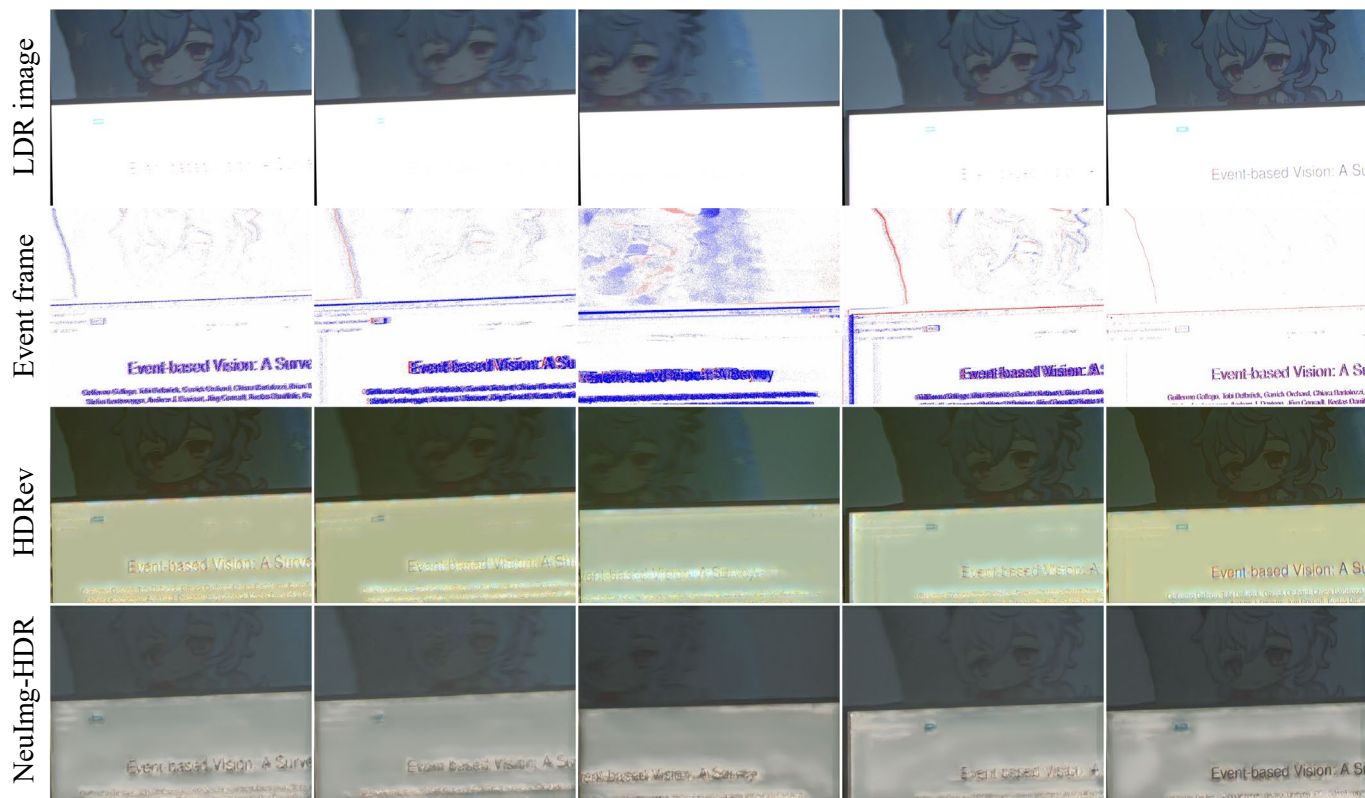


Figure S5-12: Comparison results of real-captured EVENTAID-D-Static dataset (#3 D-DISPLAY, long-exposure)



Figure S5-13: HDR reference of EVENTAID-D-Static dataset (#4 D-BUILDING)

EVENTAID-D-Static

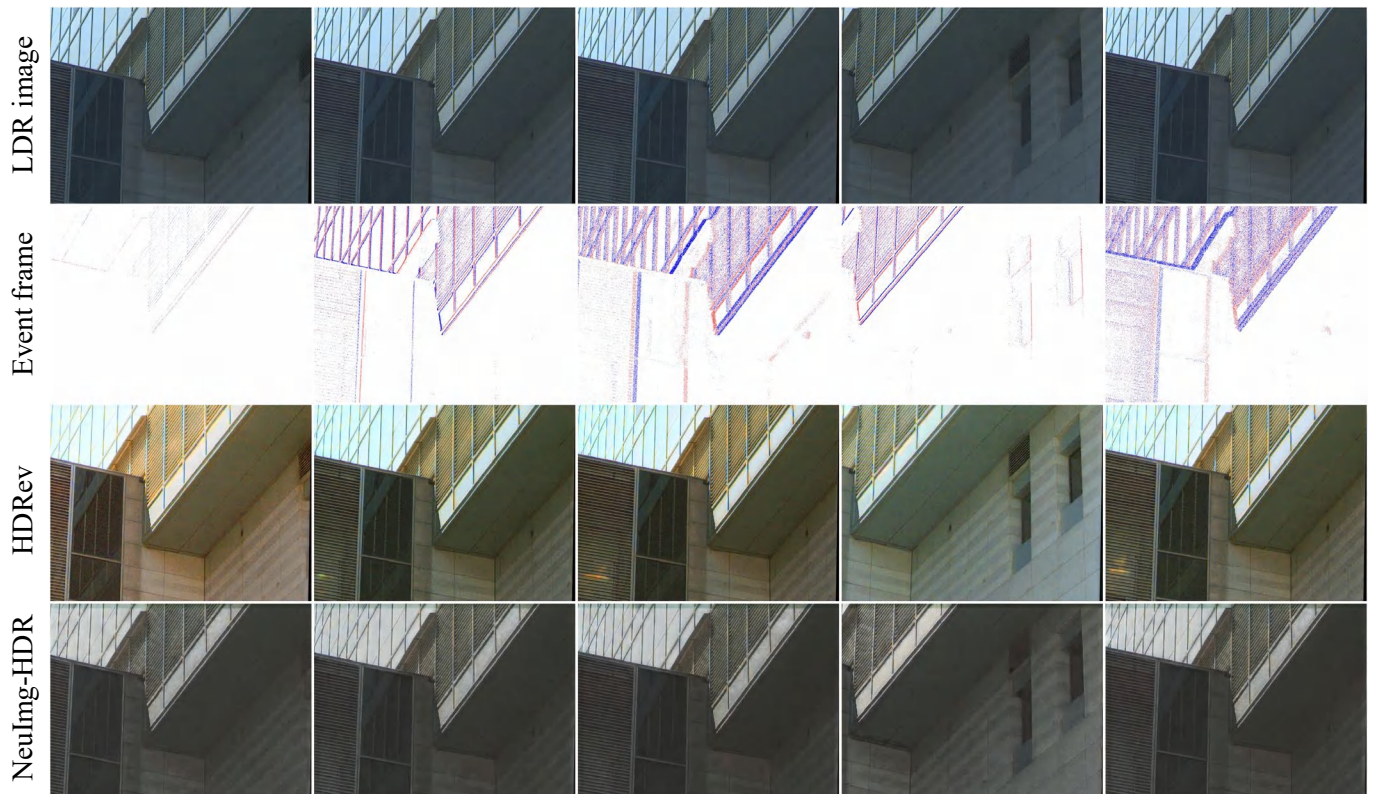


Figure S5-14: Comparison results of real-captured EVENTAID-D-Static dataset (#4 D-BUILDING, short-exposure)

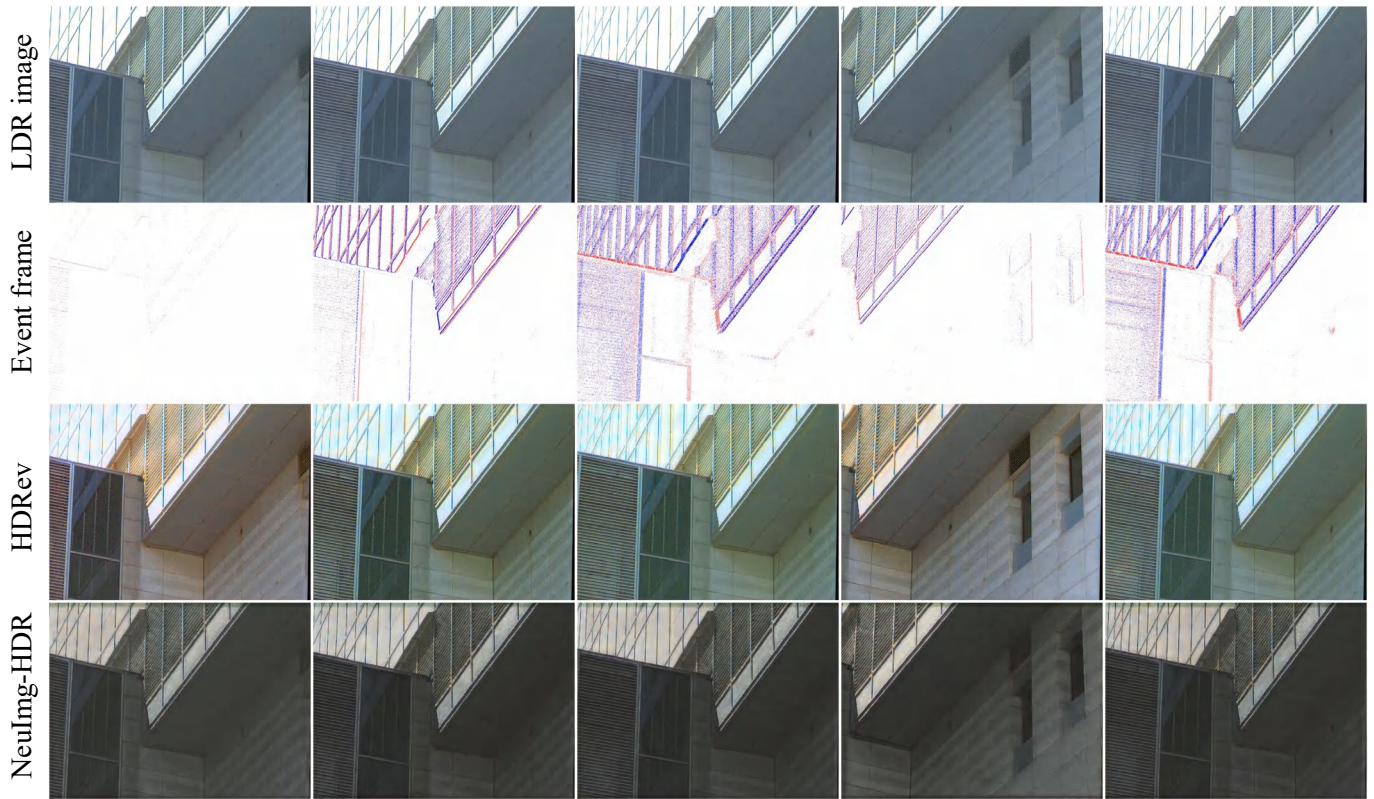


Figure S5-15: Comparison results of real-captured EVENTAID-D-Static dataset (#4 D-BUILDING, middle-exposure)

EVENTAID-D-Static



Figure S5-16: Comparison results of real-captured EVENTAID-D-Static dataset (#4 D-BUILDING, long-exposure)



Figure S5-17: HDR reference of EVENTAID-D-Static dataset (#5 D-UMBRELLA)

EVENTAID-D-Static

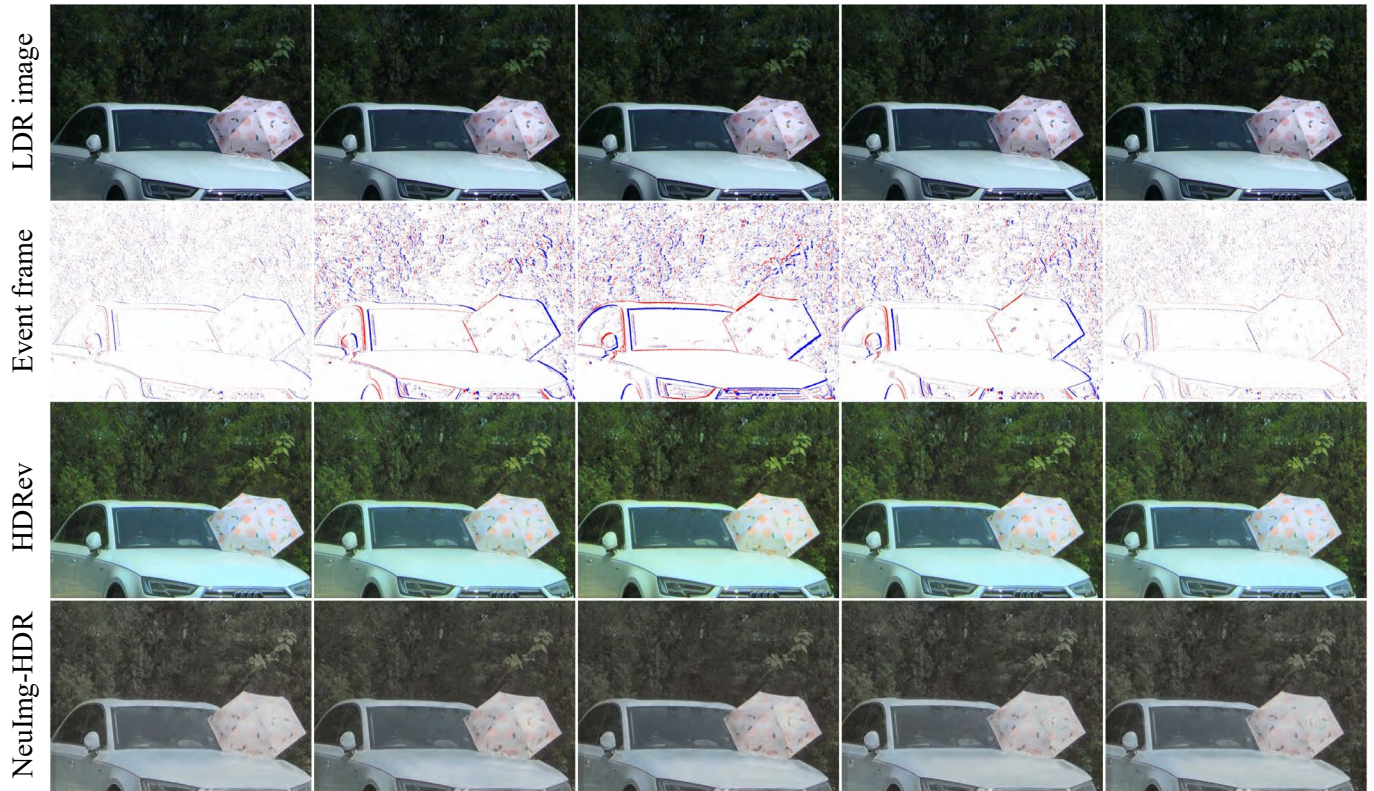


Figure S5-18: Comparison results of real-captured EVENTAID-D-Static dataset (#5 D-UMBRELLA, short-exposure)

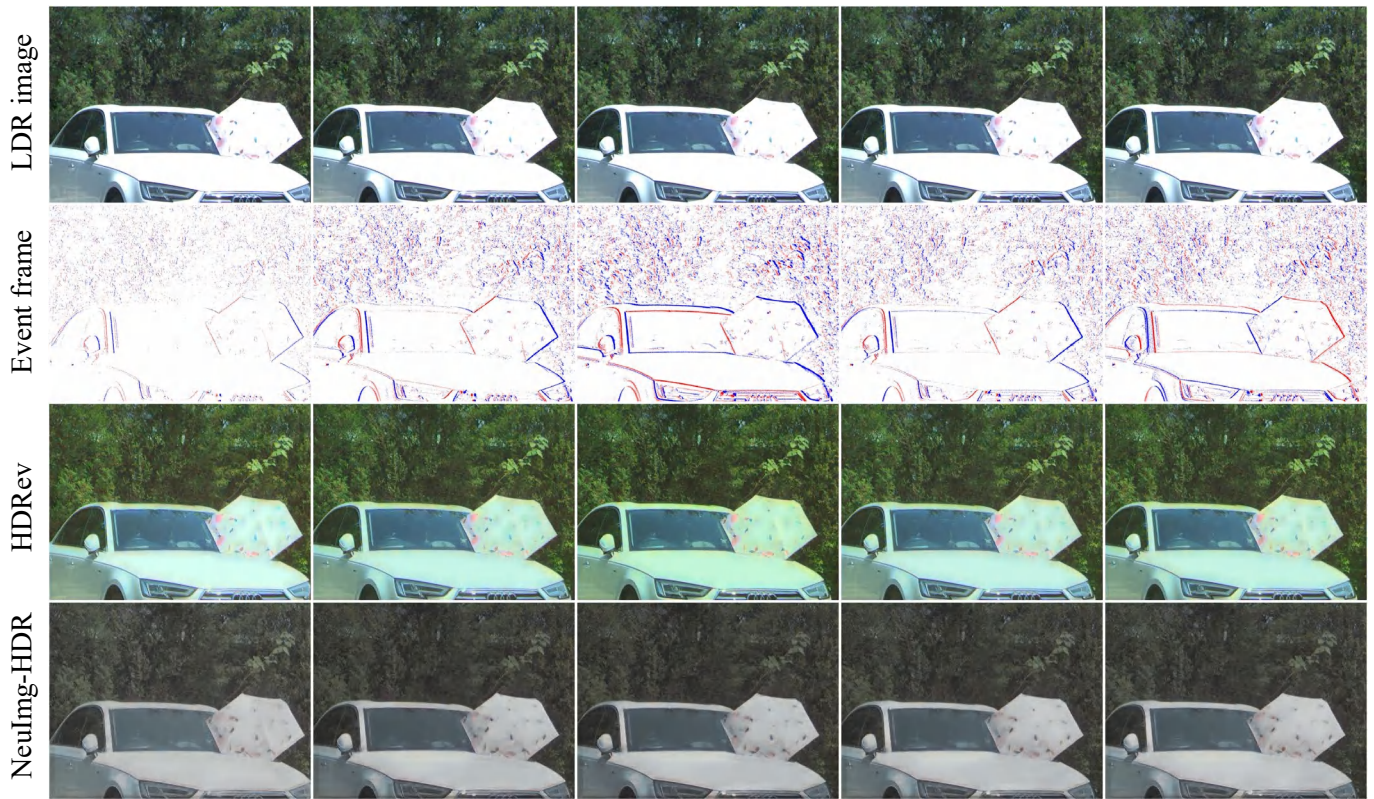


Figure S5-19: Comparison results of real-captured EVENTAID-D-Static dataset (#5 D-UMBRELLA, middle-exposure)

EVENTAID-D-Static

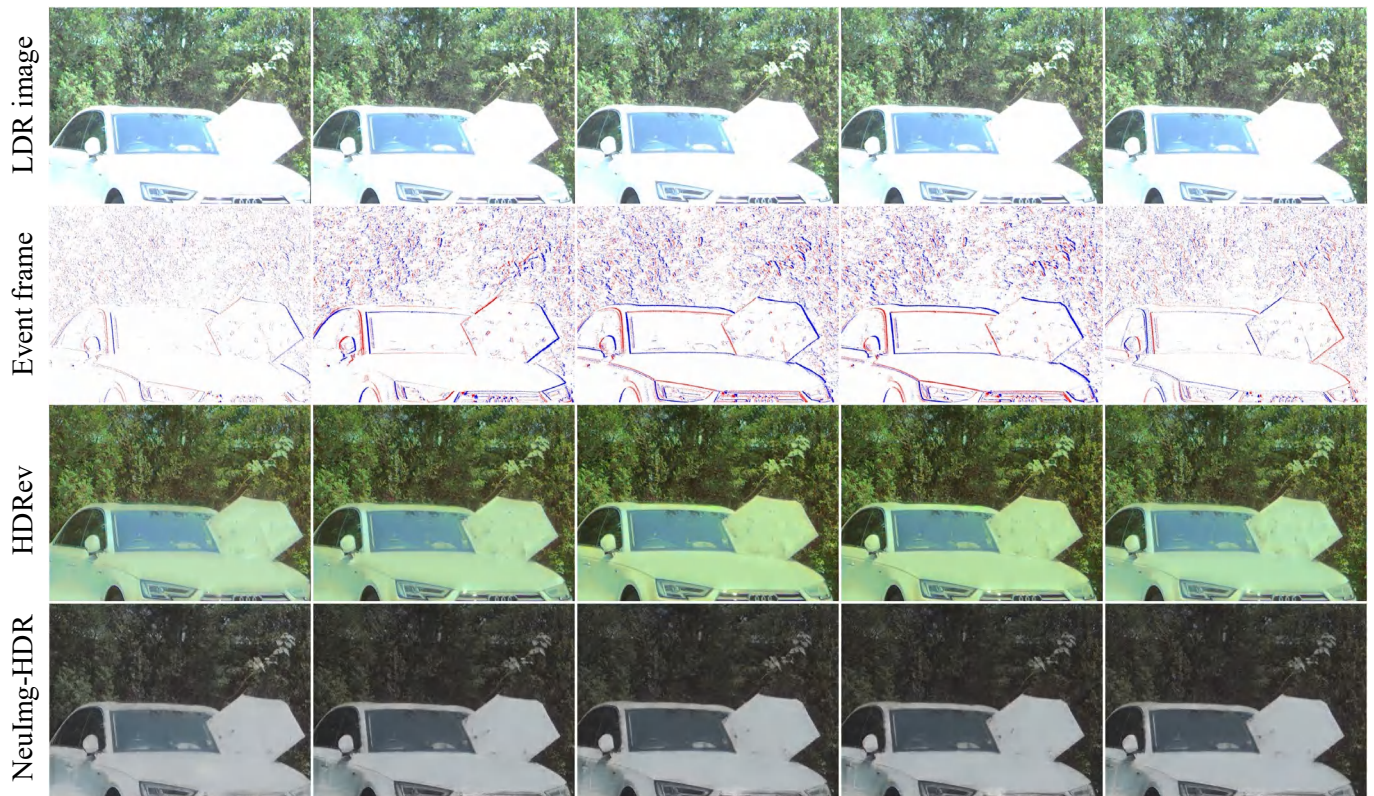


Figure S5-20: Comparison results of real-captured EVENTAID-D-Static dataset (#5 D-UMBRELLA, long-exposure)

5.2 Results on real-captured EVENTAID-D-Dynamic dataset

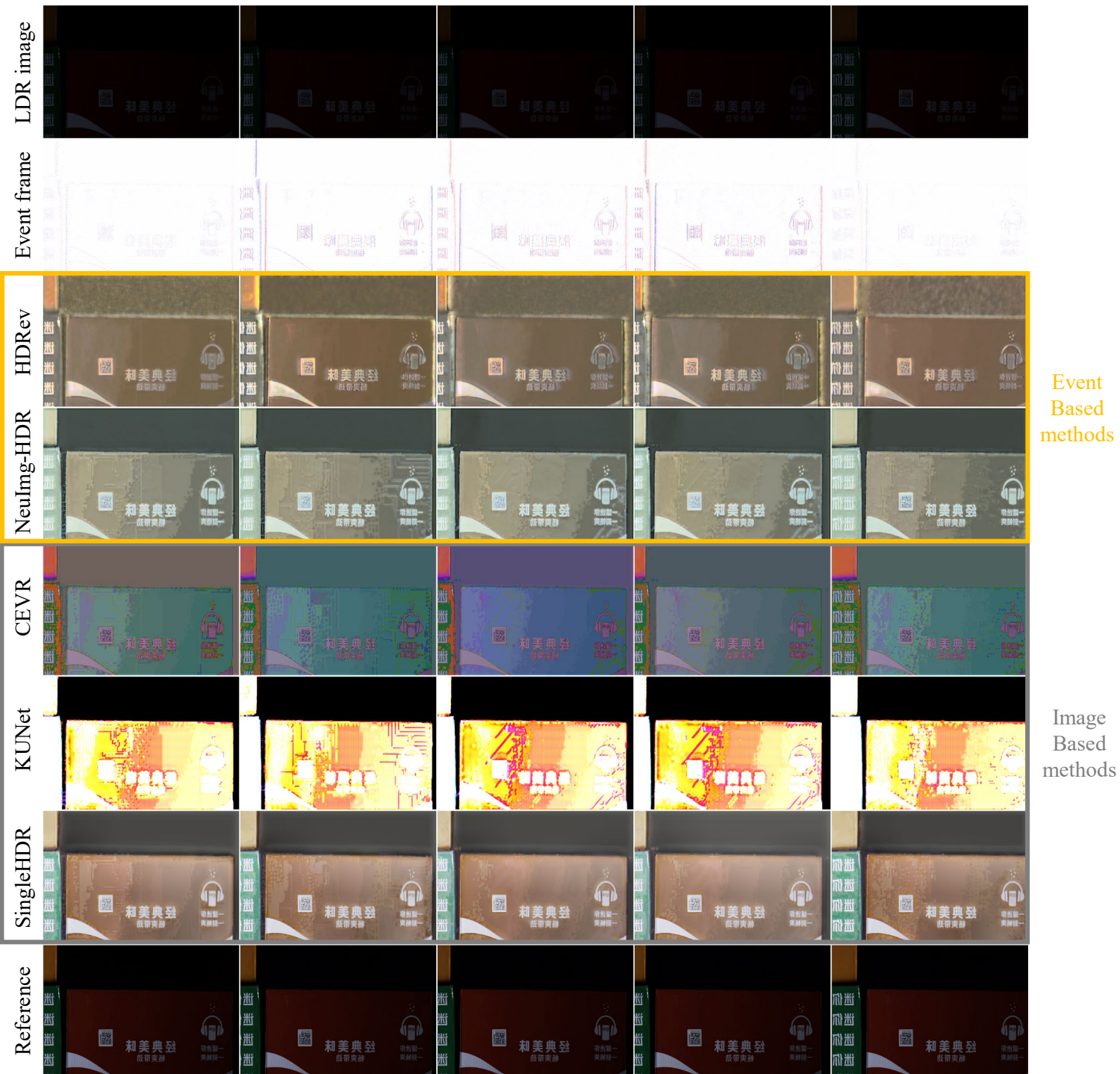


Figure S5-21: Comparison results of real-captured EVENTAID-D-Dynamic dataset (#6 D-BOXES)

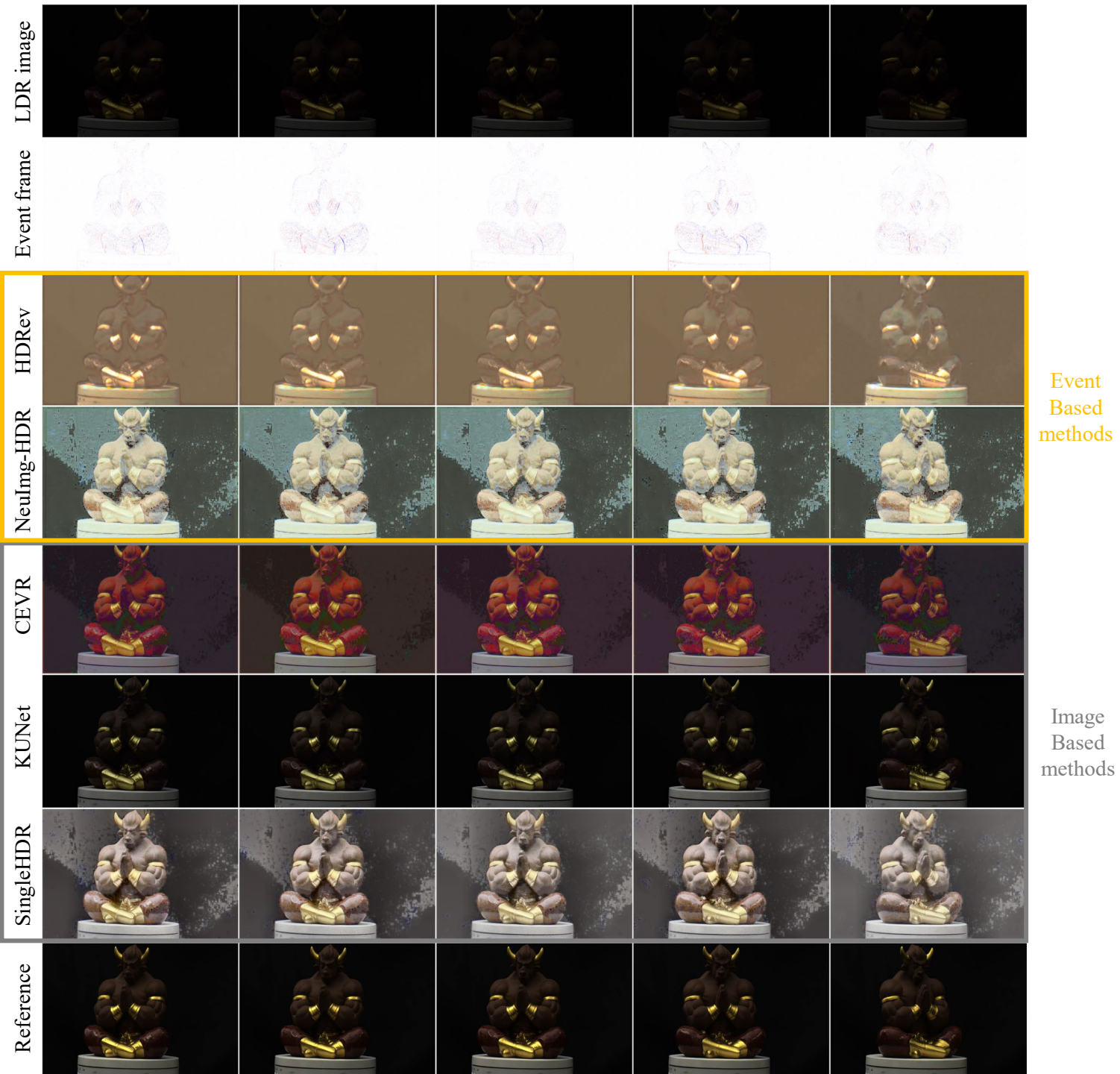


Figure S5-22: Comparison results of real-captured EVENTAID-D-Dynamic dataset (#7 D-BULL)

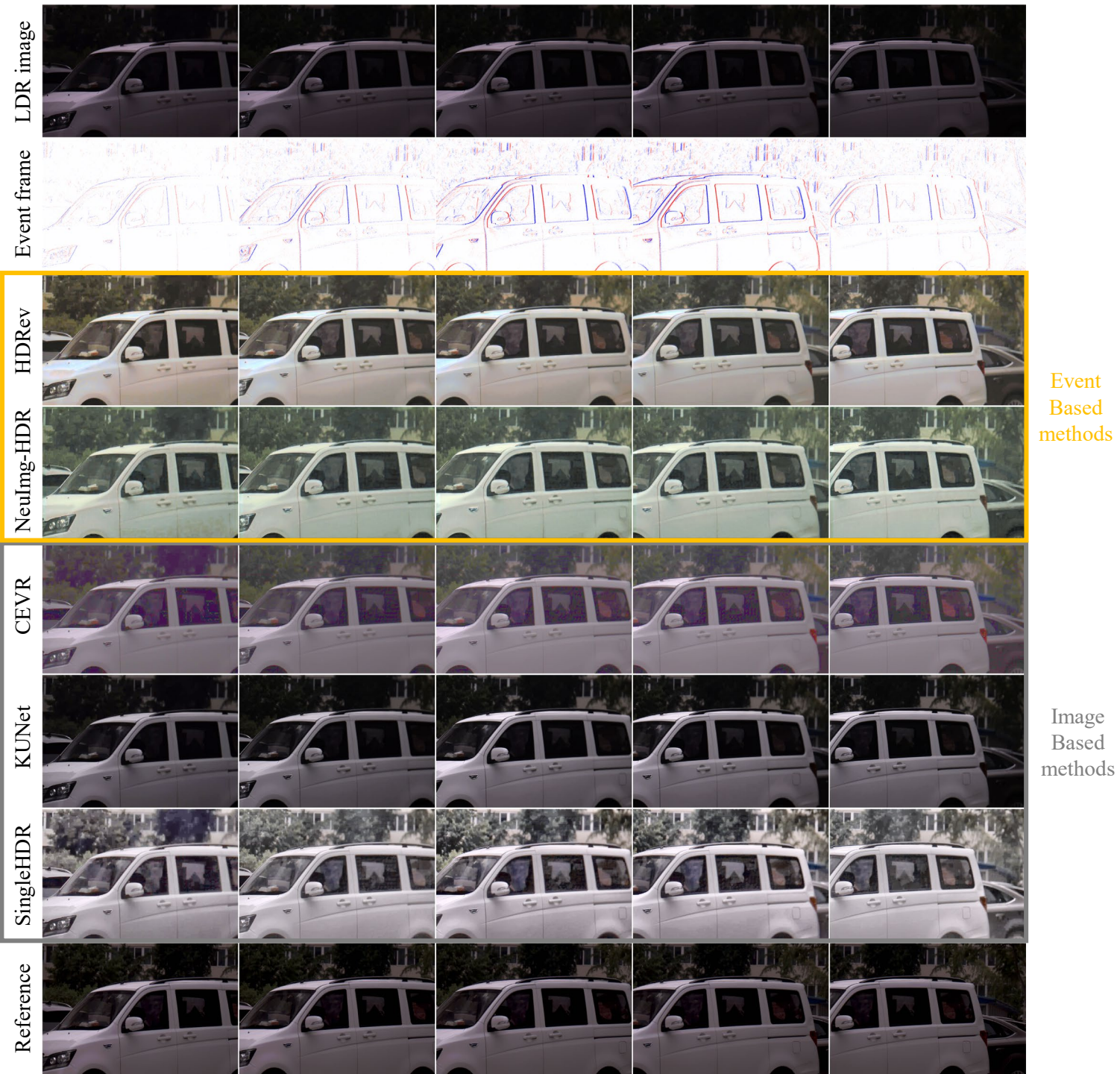


Figure S5-23: Comparison results of real-captured EVENTAID-D-Dynamic dataset (#8 D-CAR)

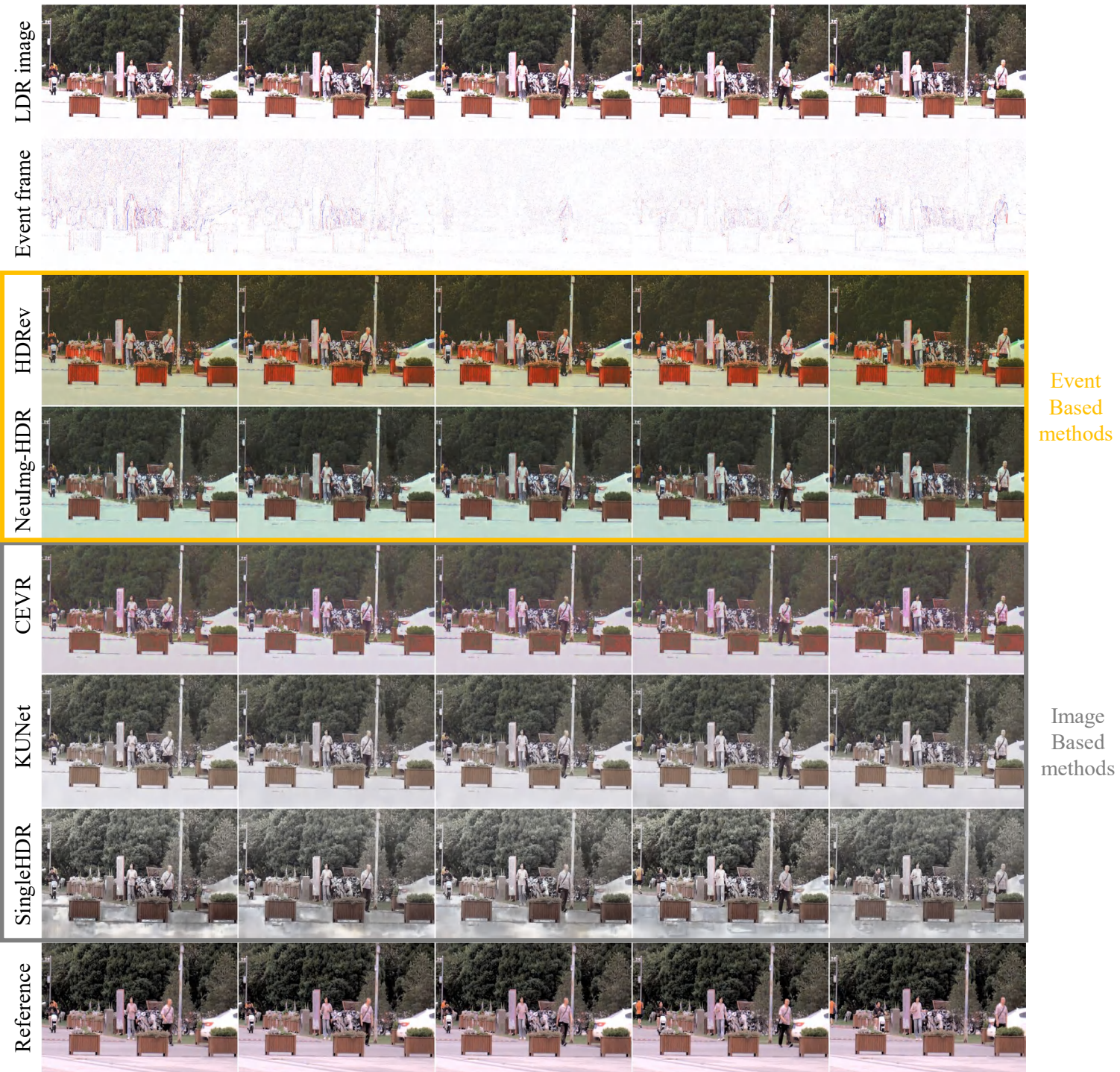
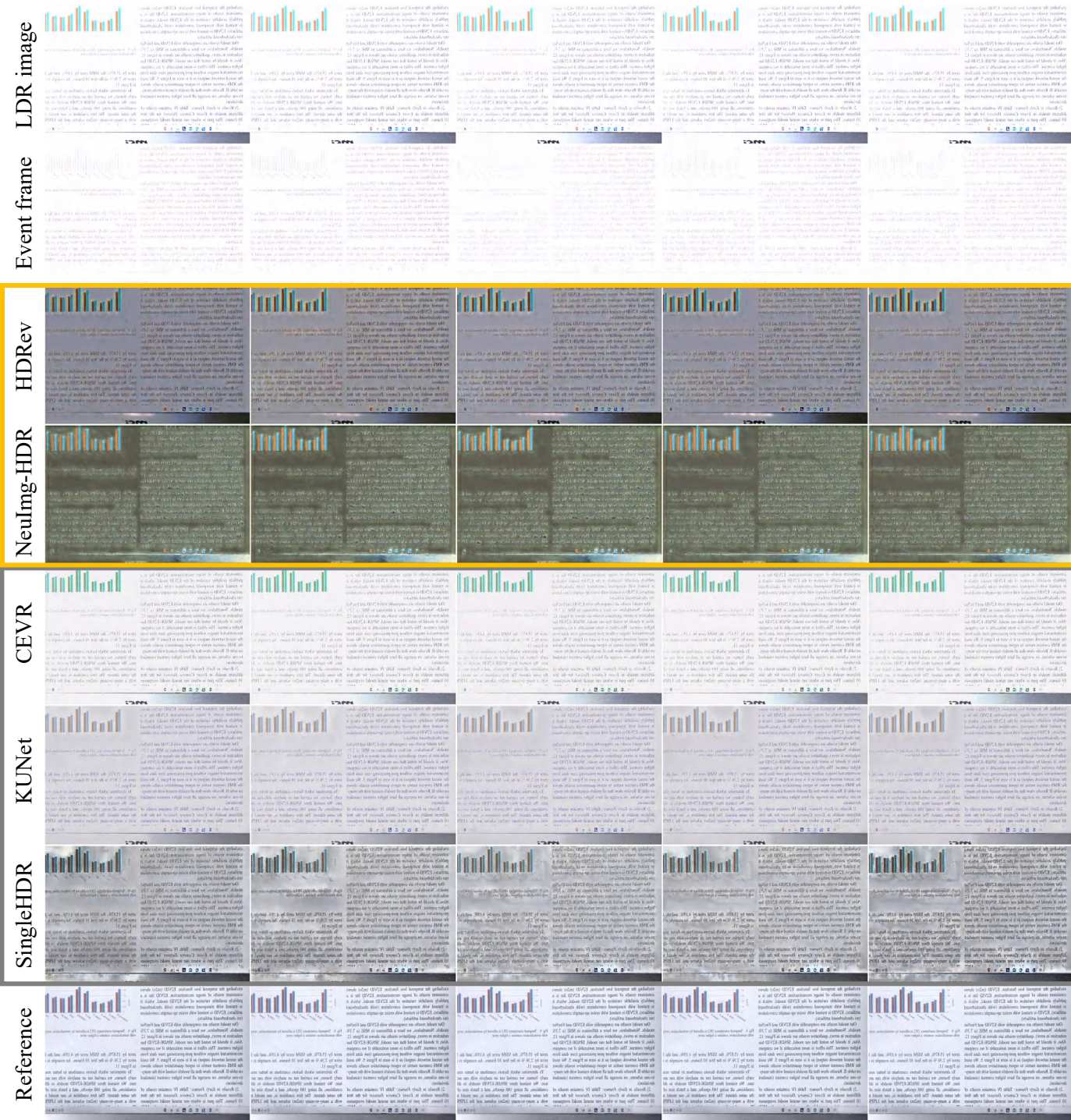


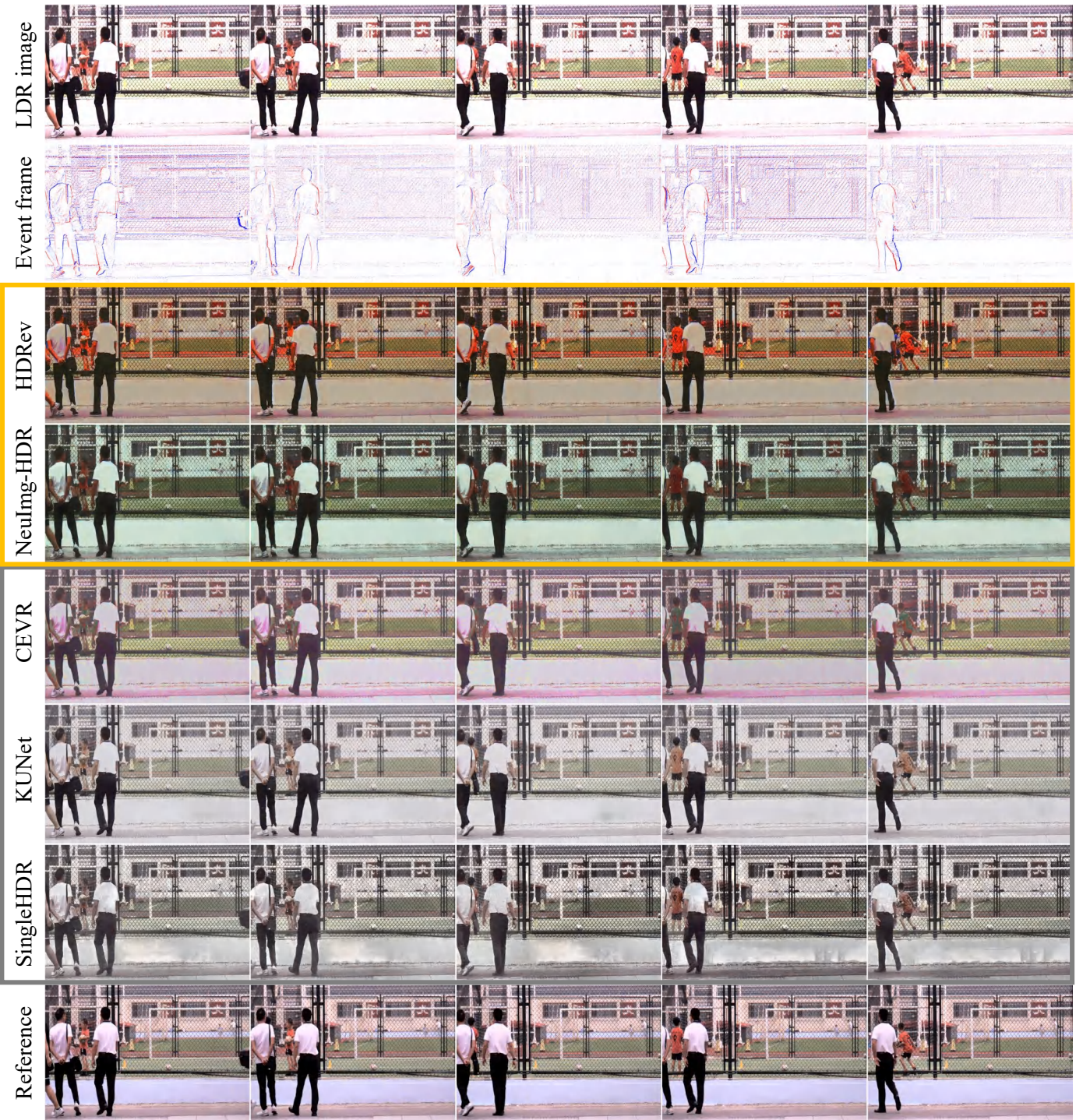
Figure S5-25: Comparison results of real-captured EVENTAID-D-Dynamic dataset (#9 D-PLAZA)



Event Based methods

Image Based methods

Figure S5-26: Comparison results of real-captured EVENTAID-D-Dynamic dataset (#10 D-PAPER)



Event Based methods

Image Based methods

EVENTAID-D -Dynamic

Figure S5-28: Comparison results of real-captured EVENTAID-D-Dynamic dataset (#11 D-SOCCER)

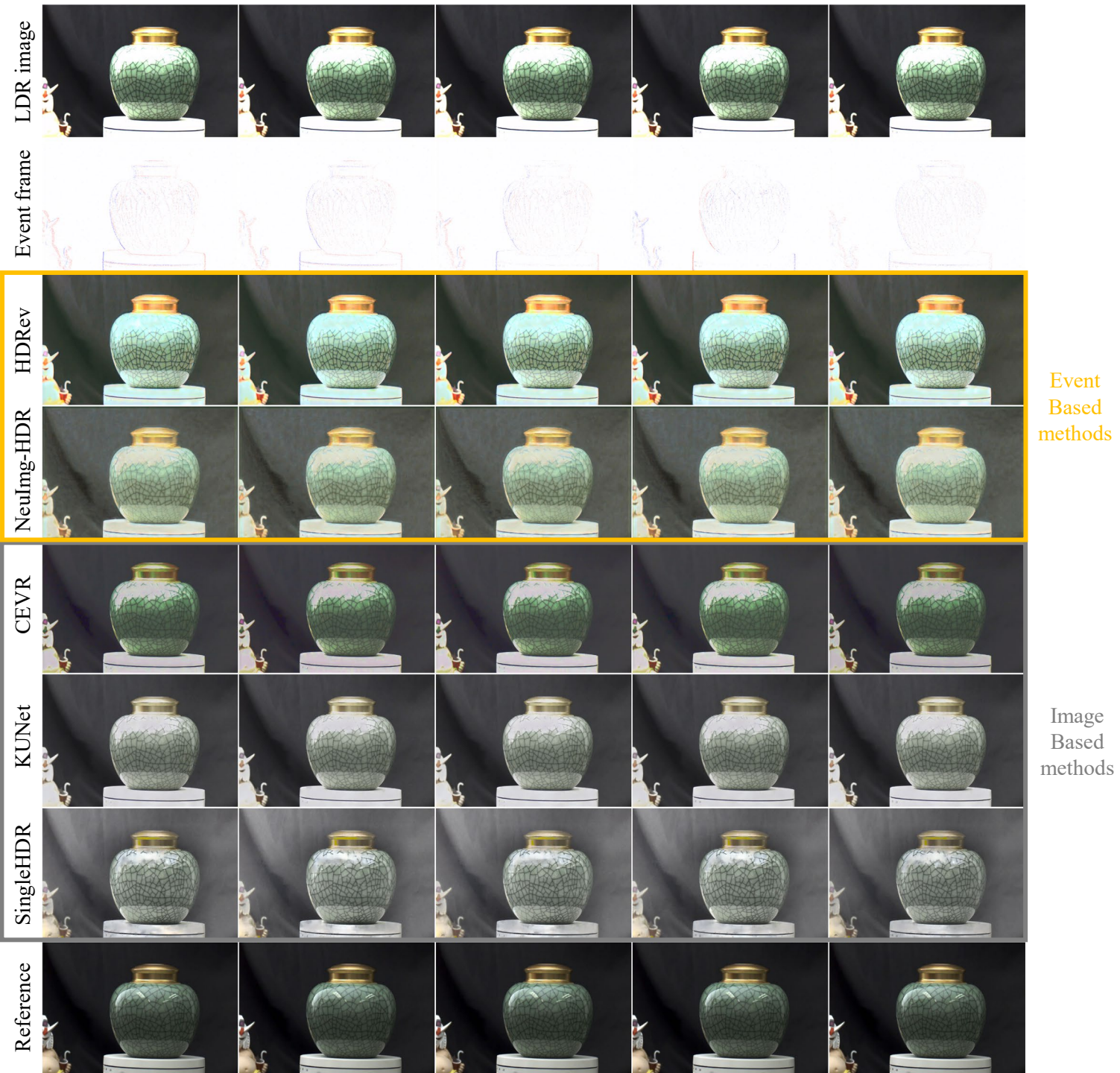


Figure S5-29: Comparison results of real-captured EVENTAID-D-Dynamic dataset (#12 D-VASE)

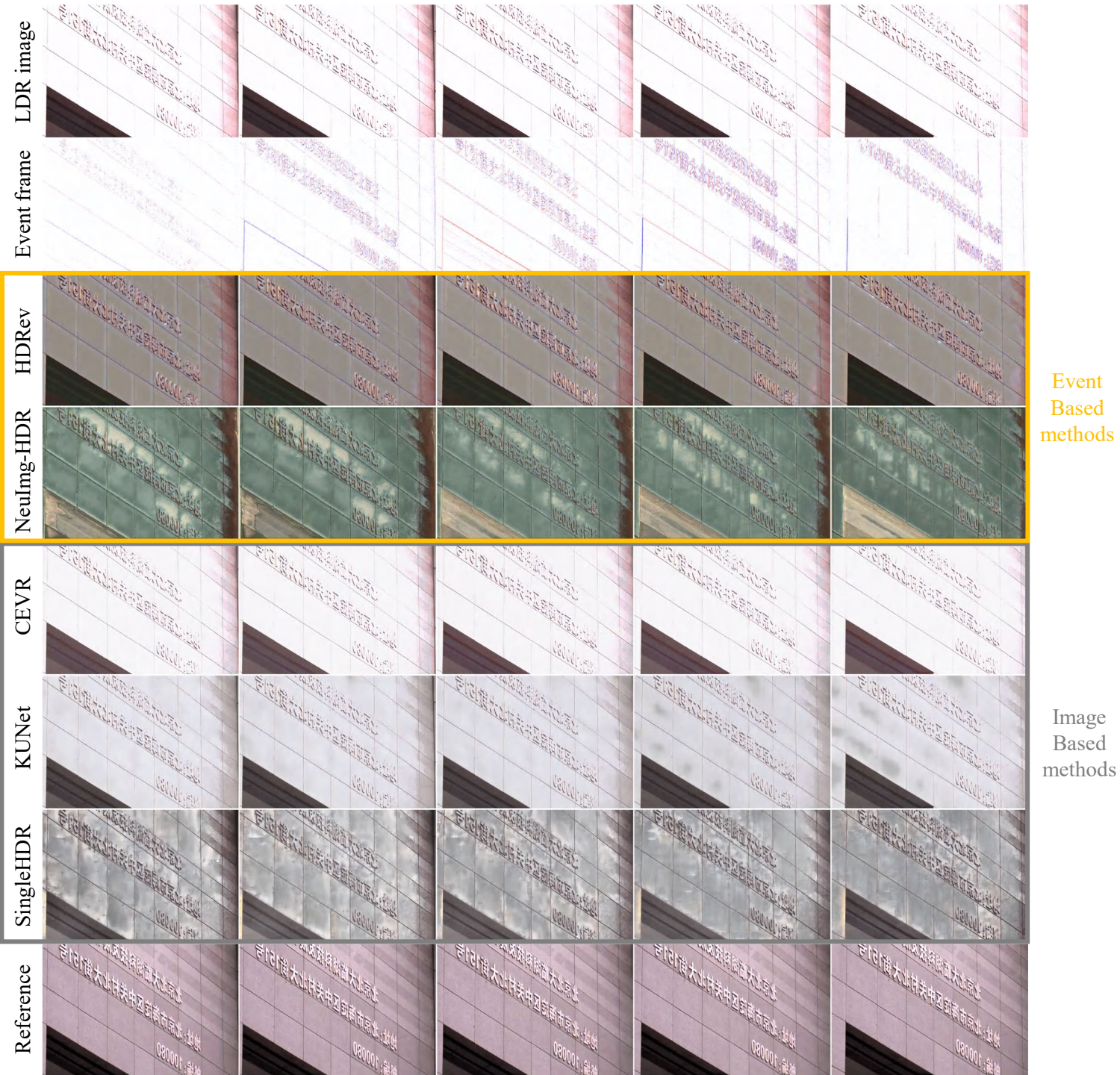


Figure S5-30: Comparison results of real-captured EVENTAID-D-Dynamic dataset (#13 D-WALL)

6 QUANTITATIVE COMPARISON RESULTS

6.1 Image Reconstruction Results on real-captured EVENTAID-R dataset

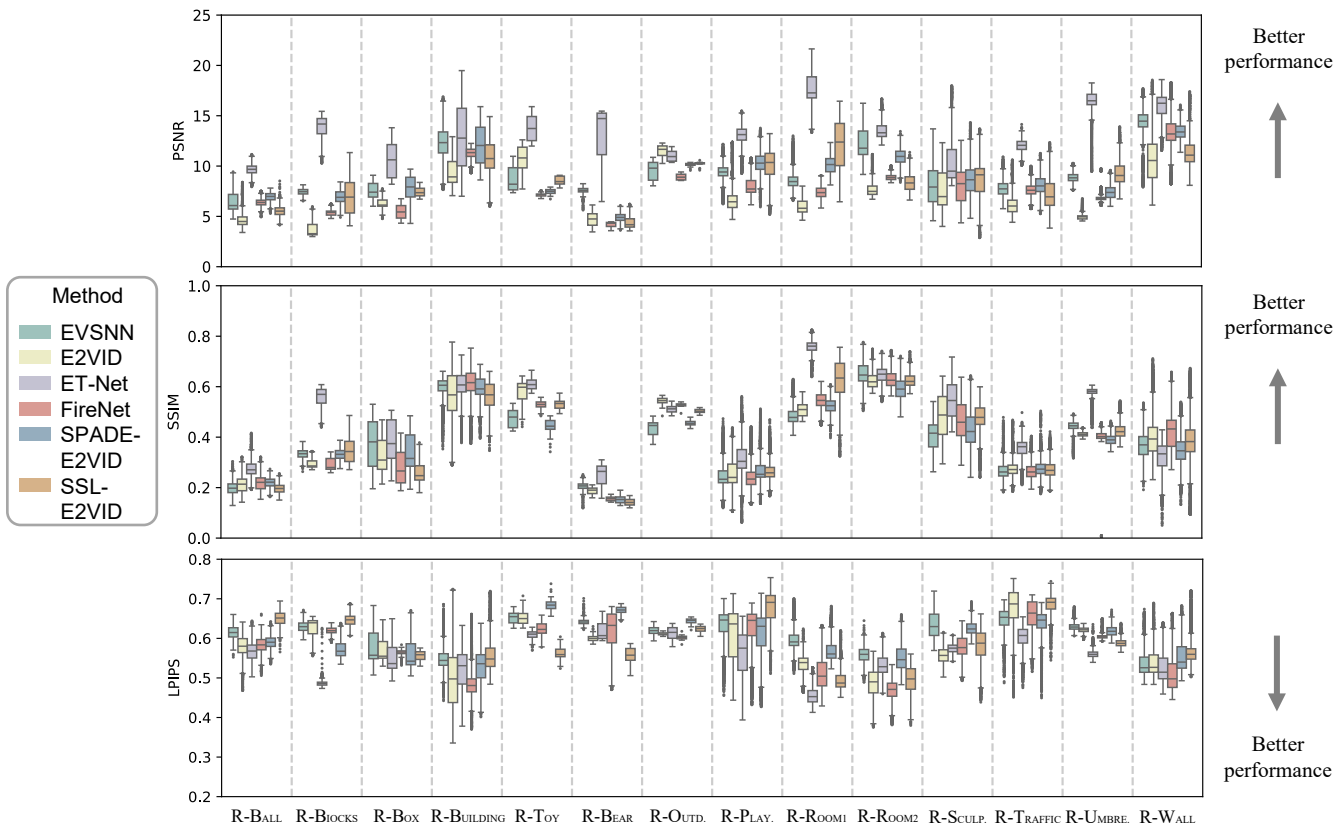


Figure S6-1

6.2 Image Reconstruction Results on Simulated EVENTAID-R-V2E dataset

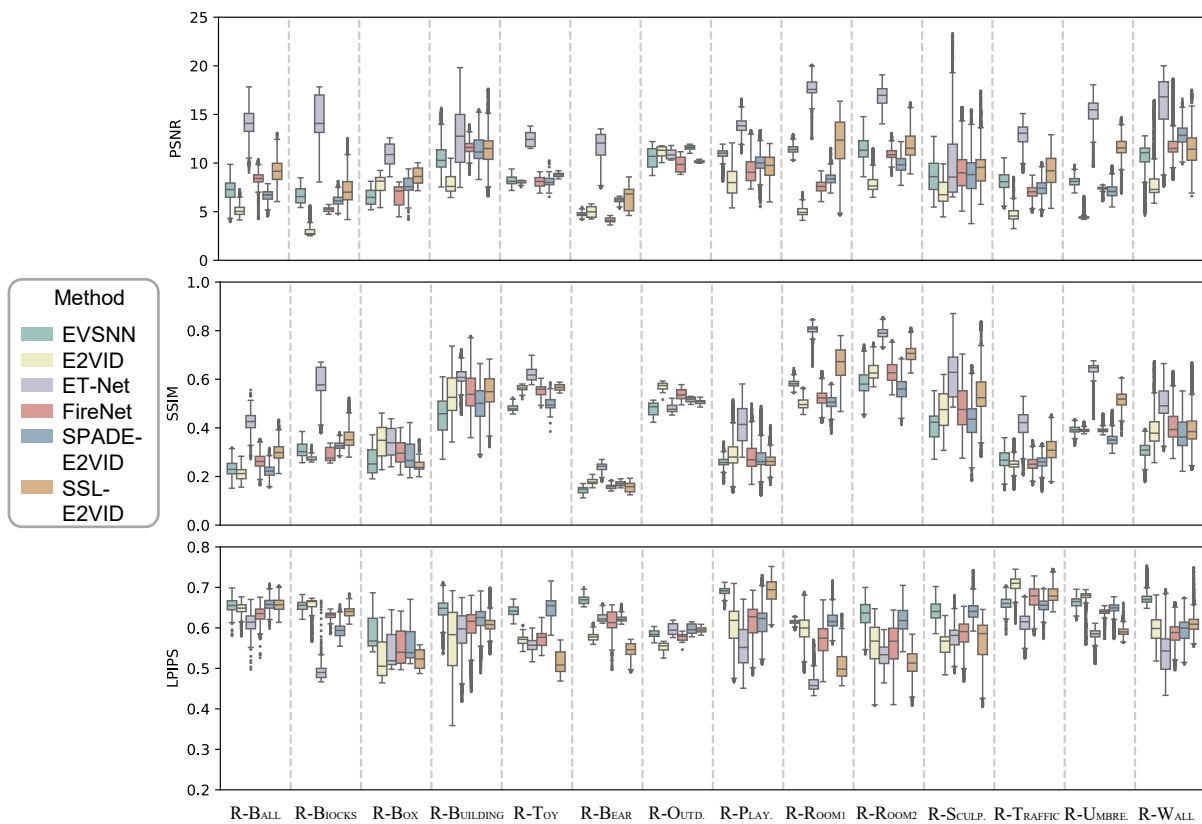


Figure S6-2

6.3 Image Reconstruction Results on Simulated EVENTAID-R-VM dataset

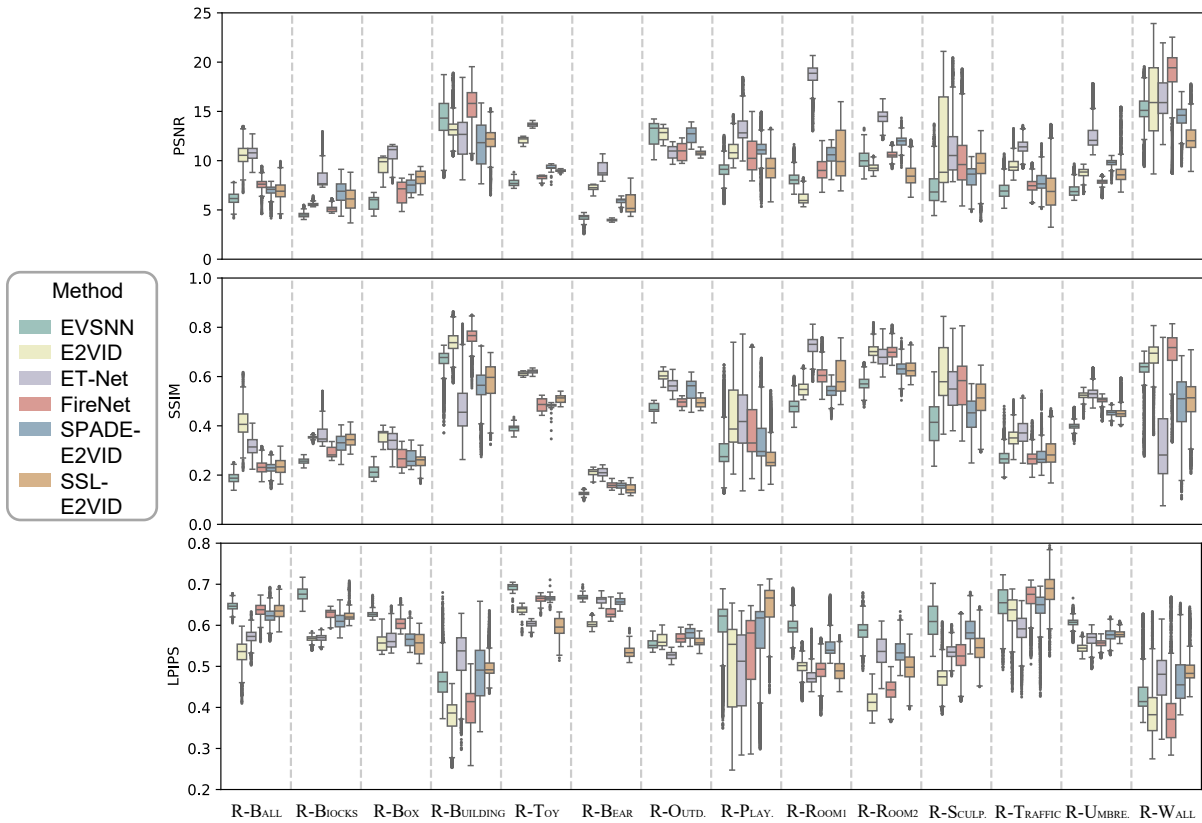


Figure S6-3

6.4 HFR Video Reconstruction Results on Real-captured EVENTAID-F dataset (pretrained model)

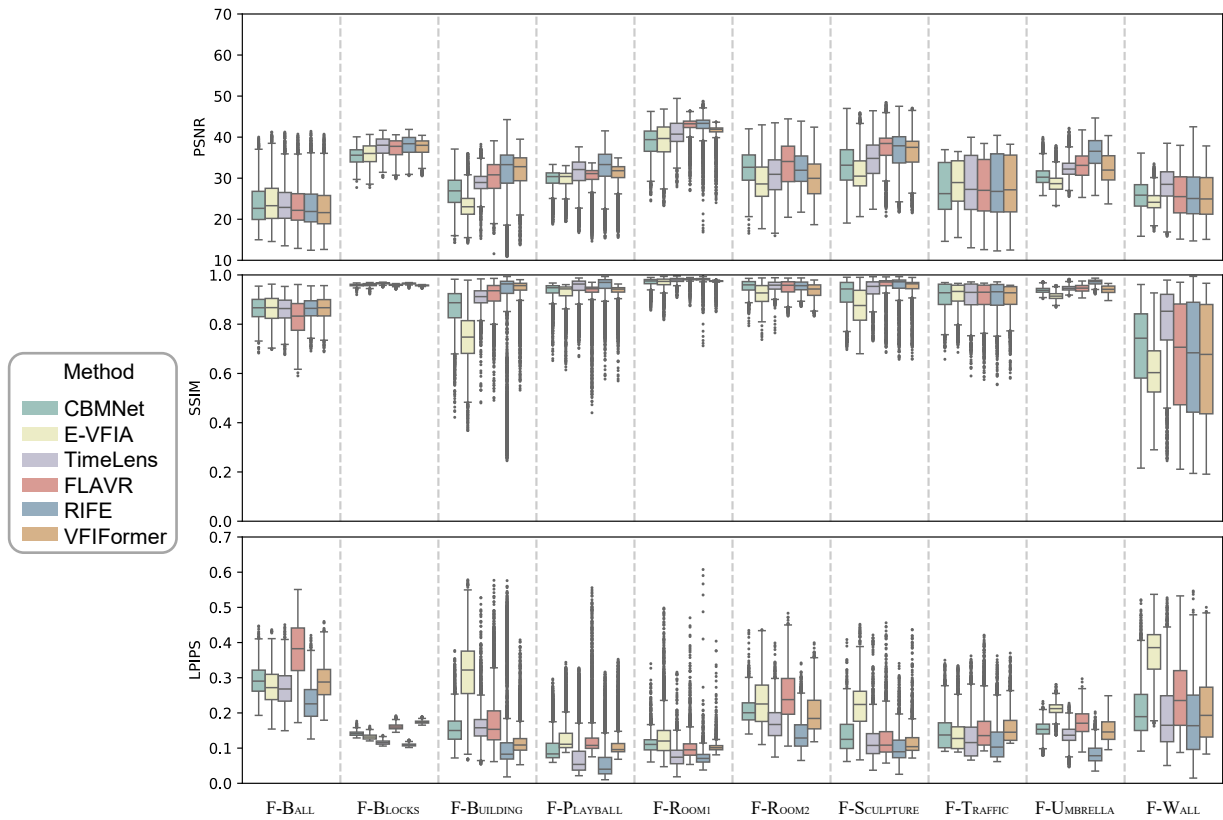


Figure S6-4

6.5 HFR Video Reconstruction Results on Real-captured EVENTAID-F dataset (finetuned model)

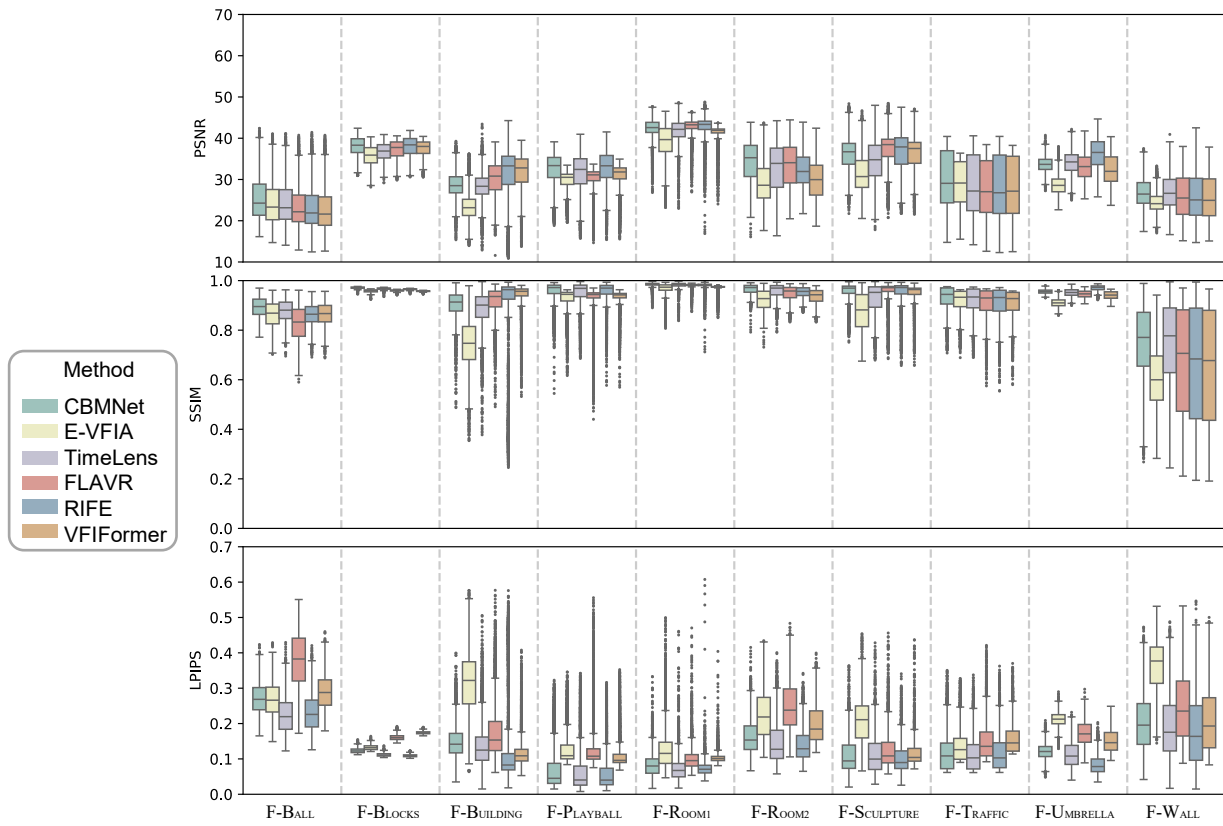


Figure S6-5

6.6 HFR Video Reconstruction Results on Simulated EVENTAID-F-V2E dataset

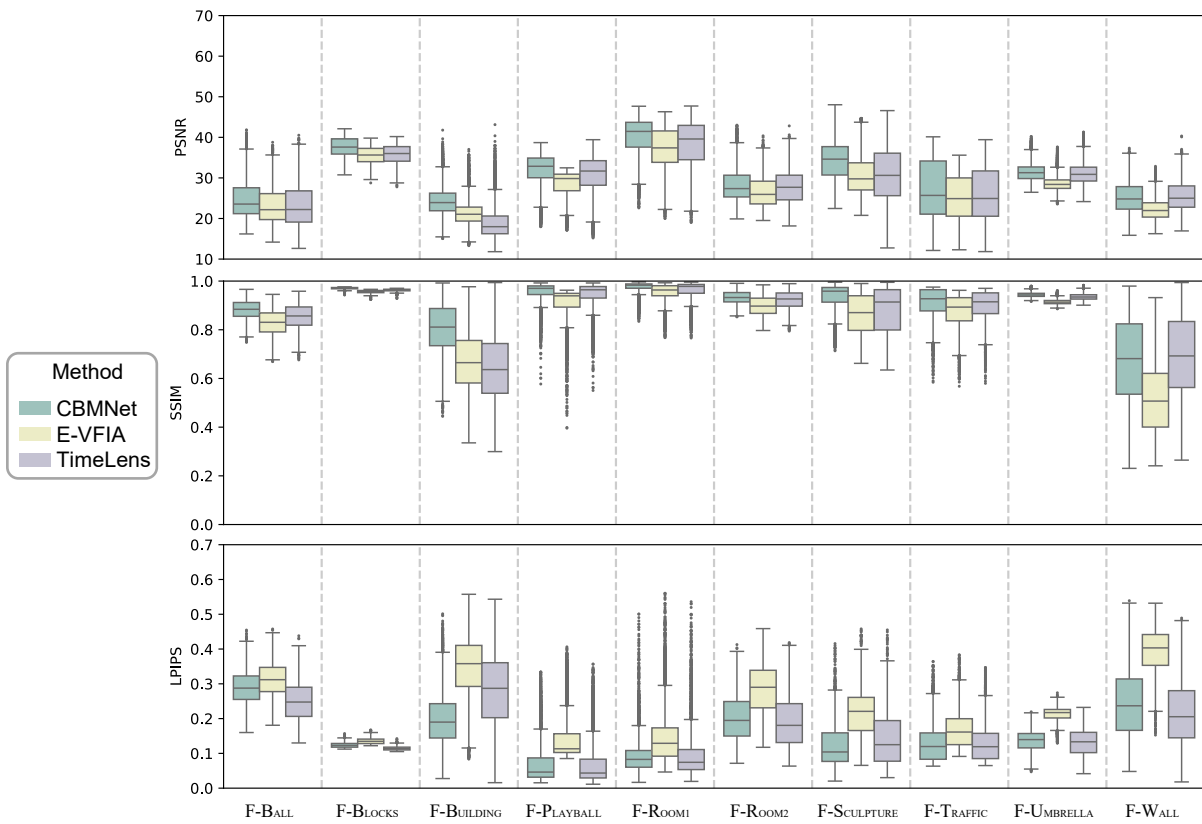


Figure S6-6

6.7 HFR Video Reconstruction Results on Simulated EVENTAID-F-VM dataset

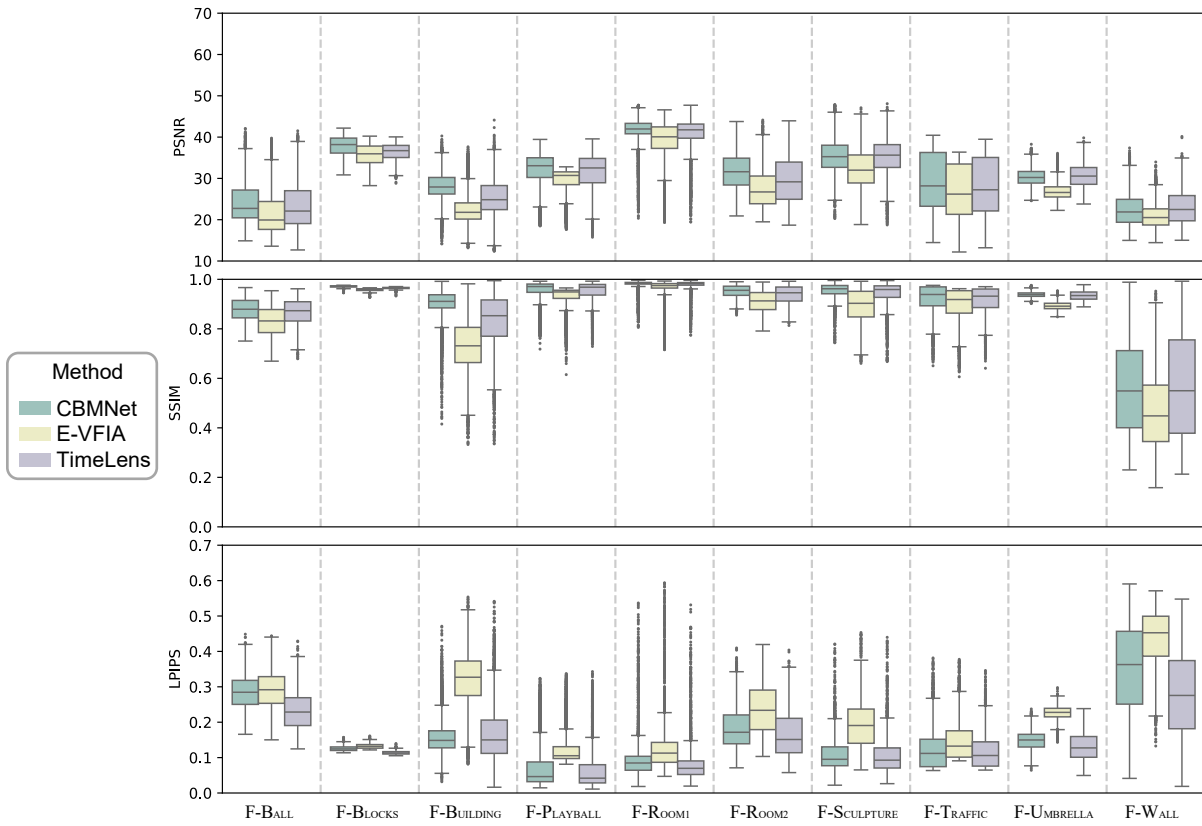


Figure S6-7

6.8 Image Deblurring Results on Real-captured EVENTAID-B dataset (pretrained model)

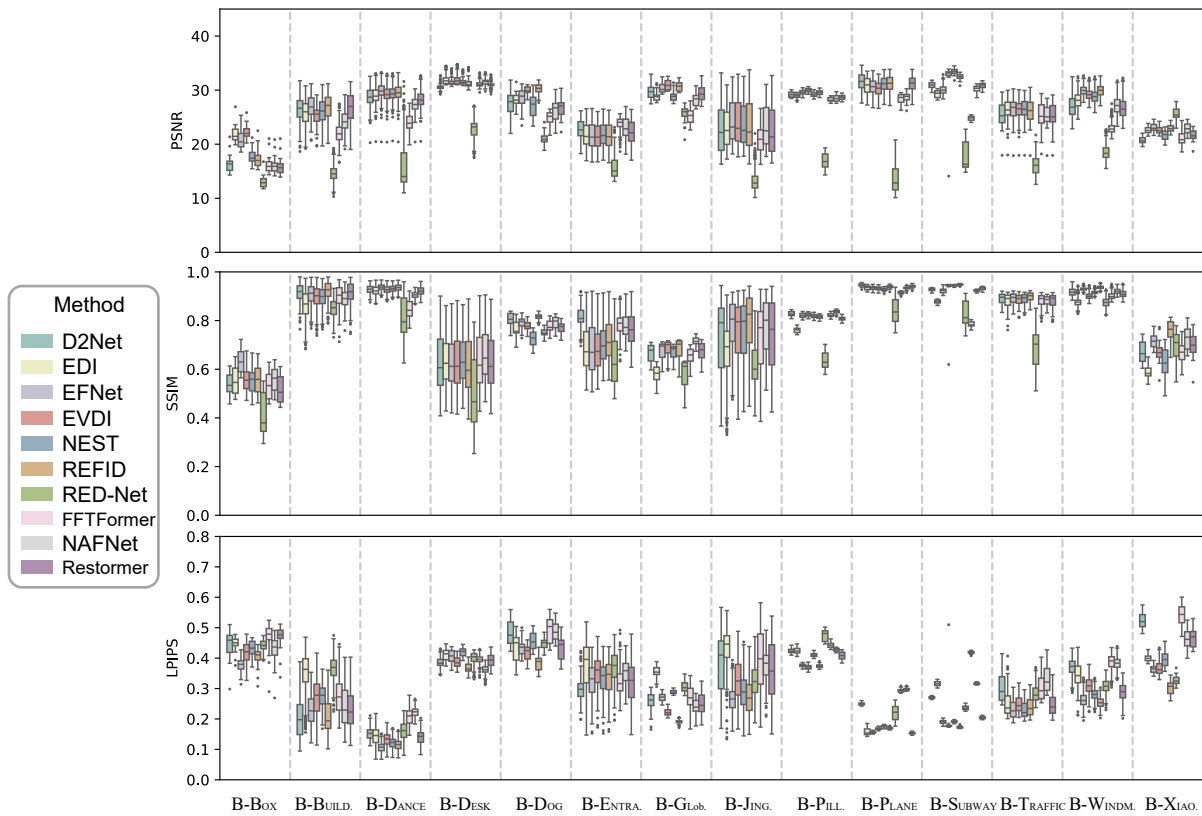


Figure S6-8

6.9 Image Deblurring Results on Real-captured EVENTAID-B dataset (finetuned model)

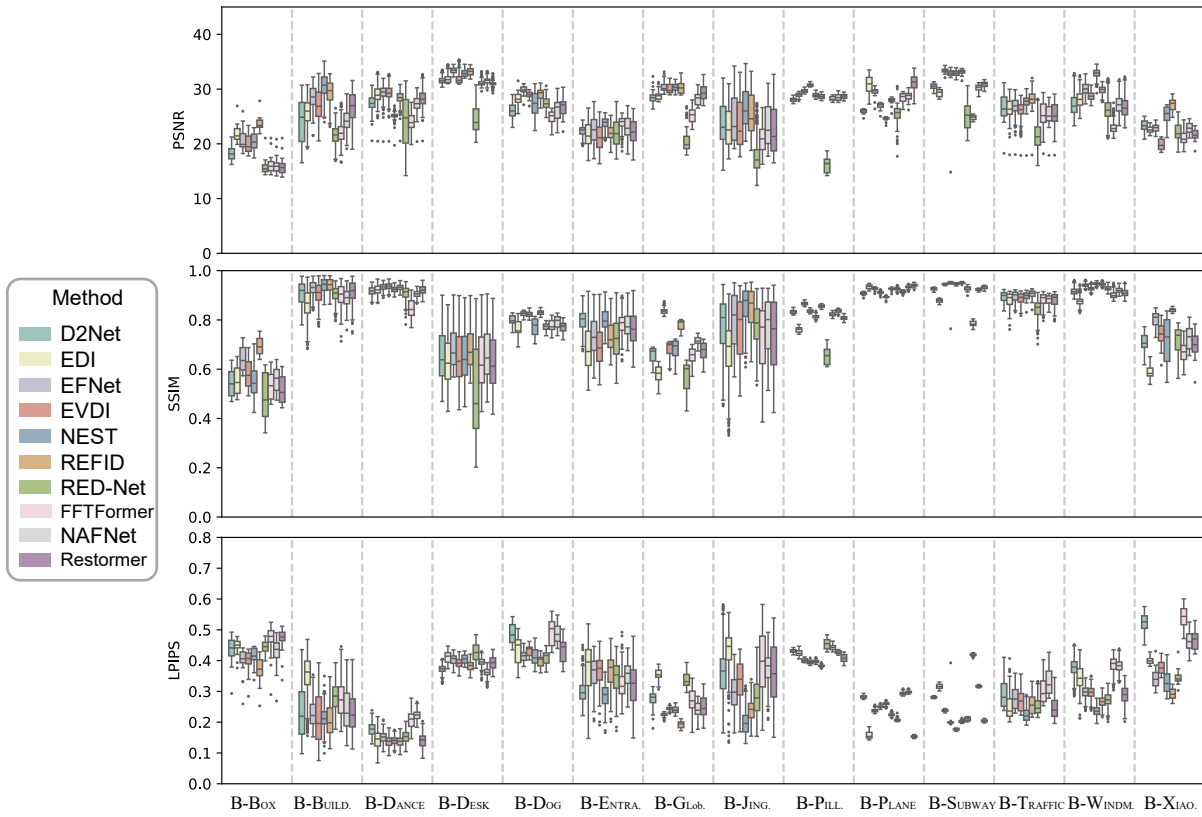


Figure S6-9

6.10 Image Deblurring Results on Simulated EVENTAID-B-V2E dataset

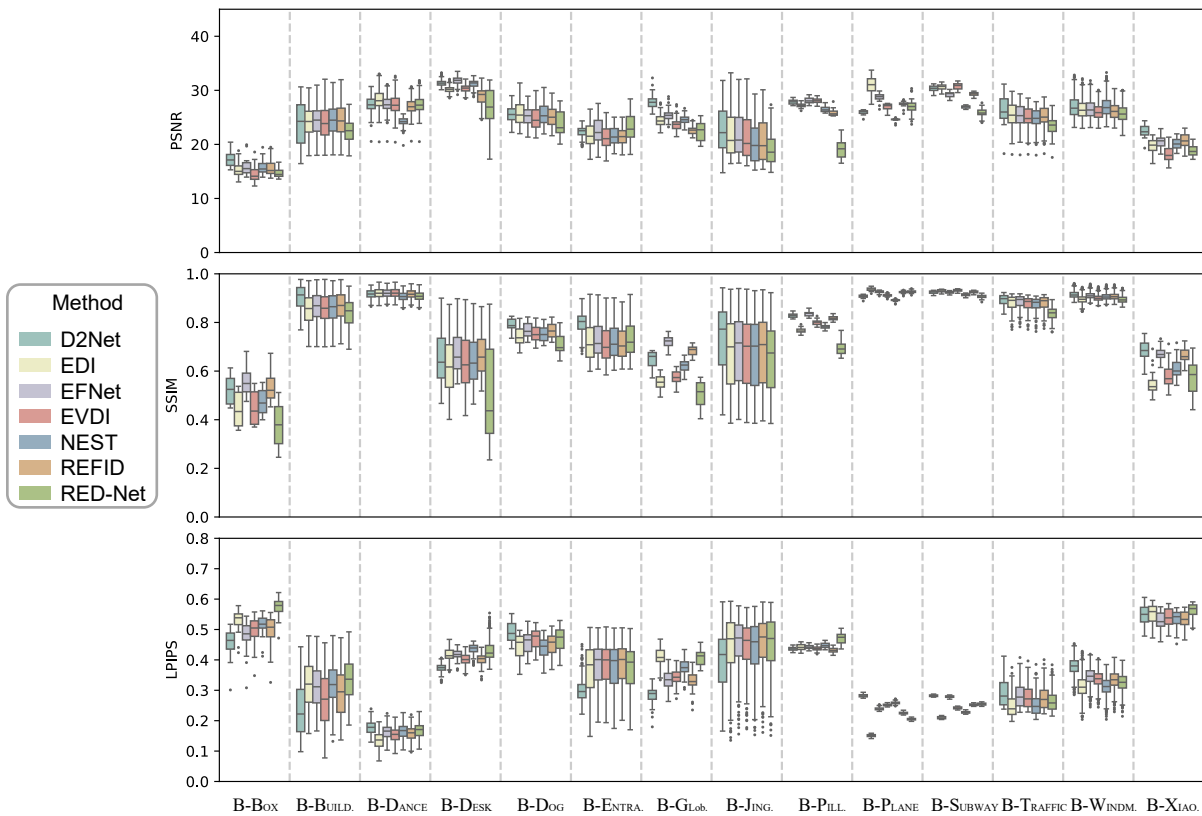


Figure S6-10

6.11 Image Deblurring Results on Simulated EVENTAID-B-VM dataset

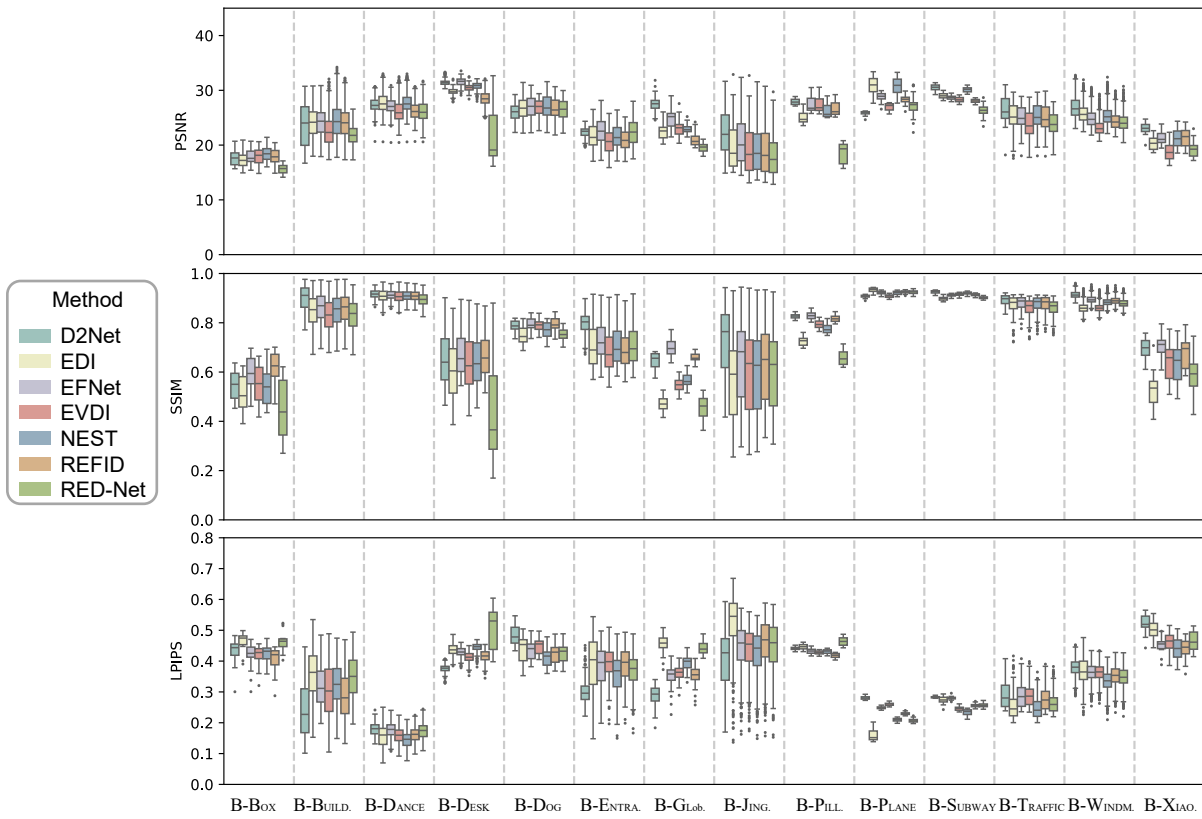


Figure S6-11

6.12 Image Super Resolution Results on Real-captured EVENTAID-S dataset

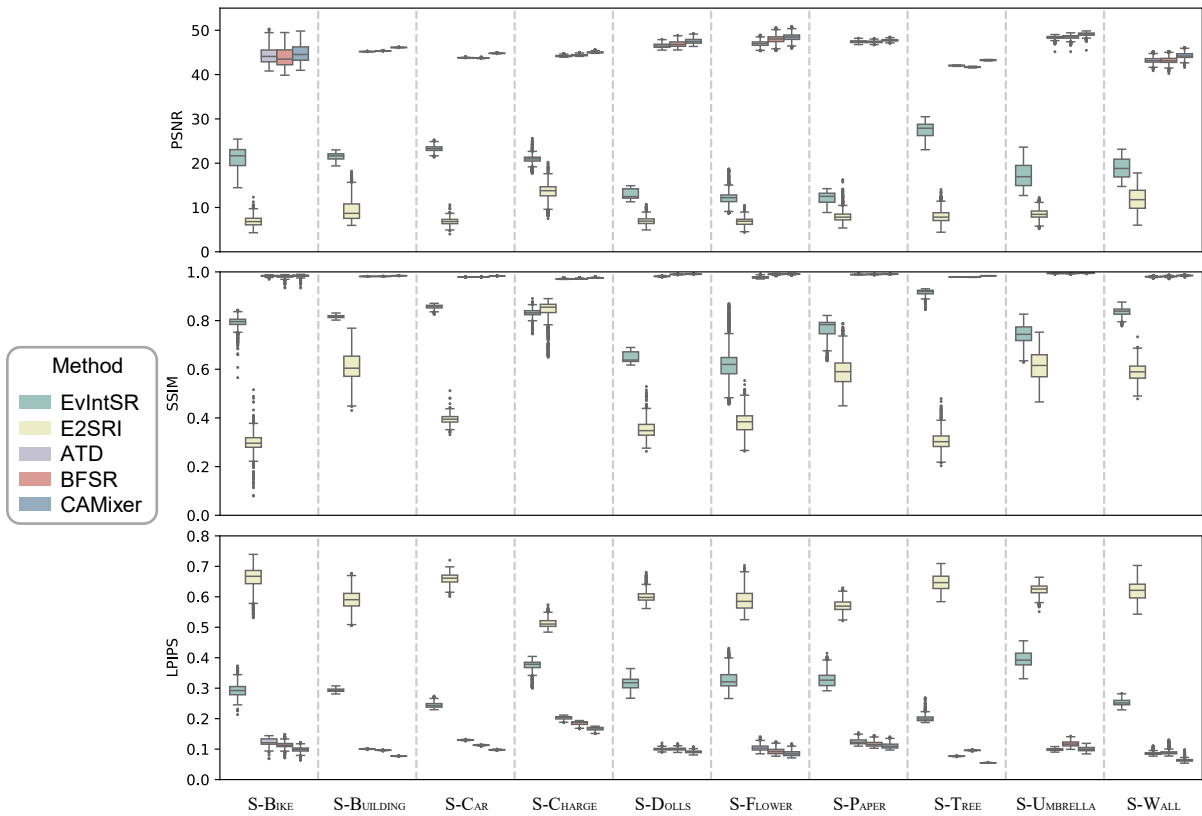


Figure S6-12

6.13 Image Super Resolution Results on Simulated EVENTAID-S-V2E dataset

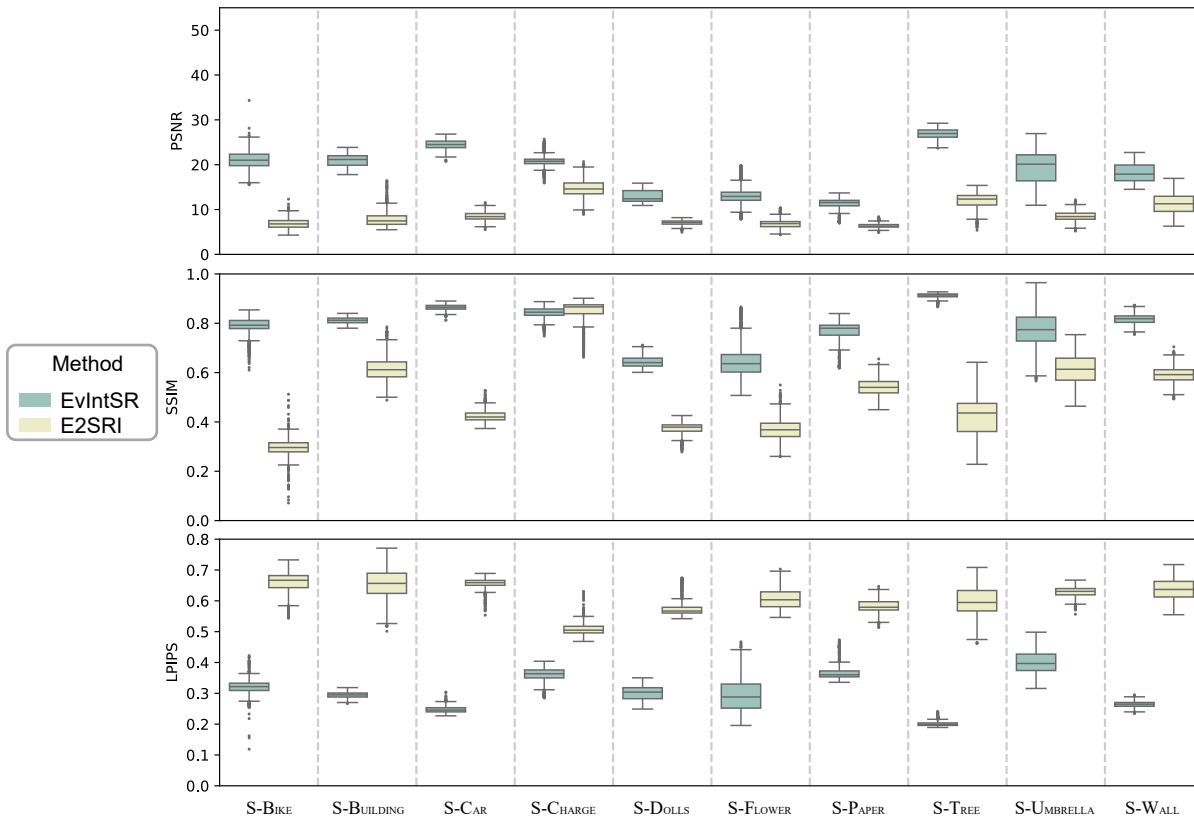


Figure S6-13

6.14 Image Super Resolution Results on Simulated EVENTAID-S-VM dataset

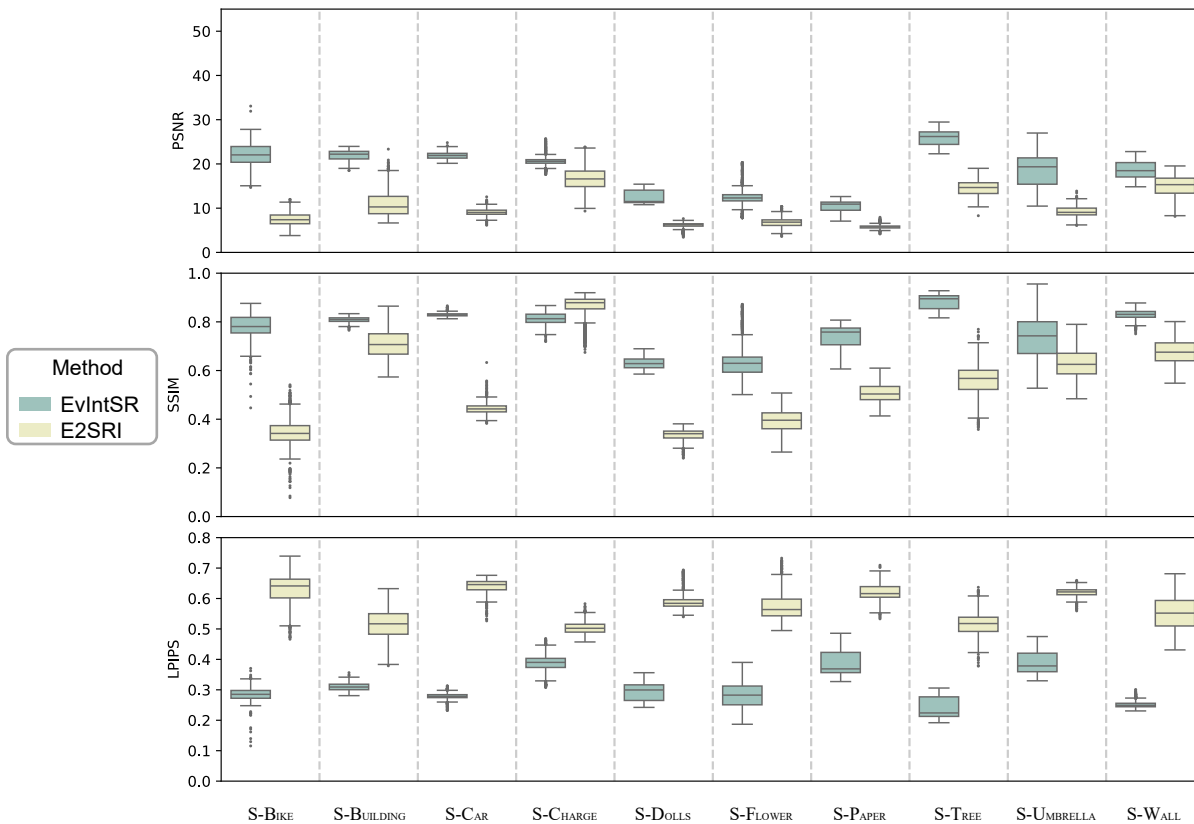


Figure S6-14