

STP Products from PPS versions With and Without Truncation problem,
and their Differences, for ~ 9 Hour Steady Precipitation event

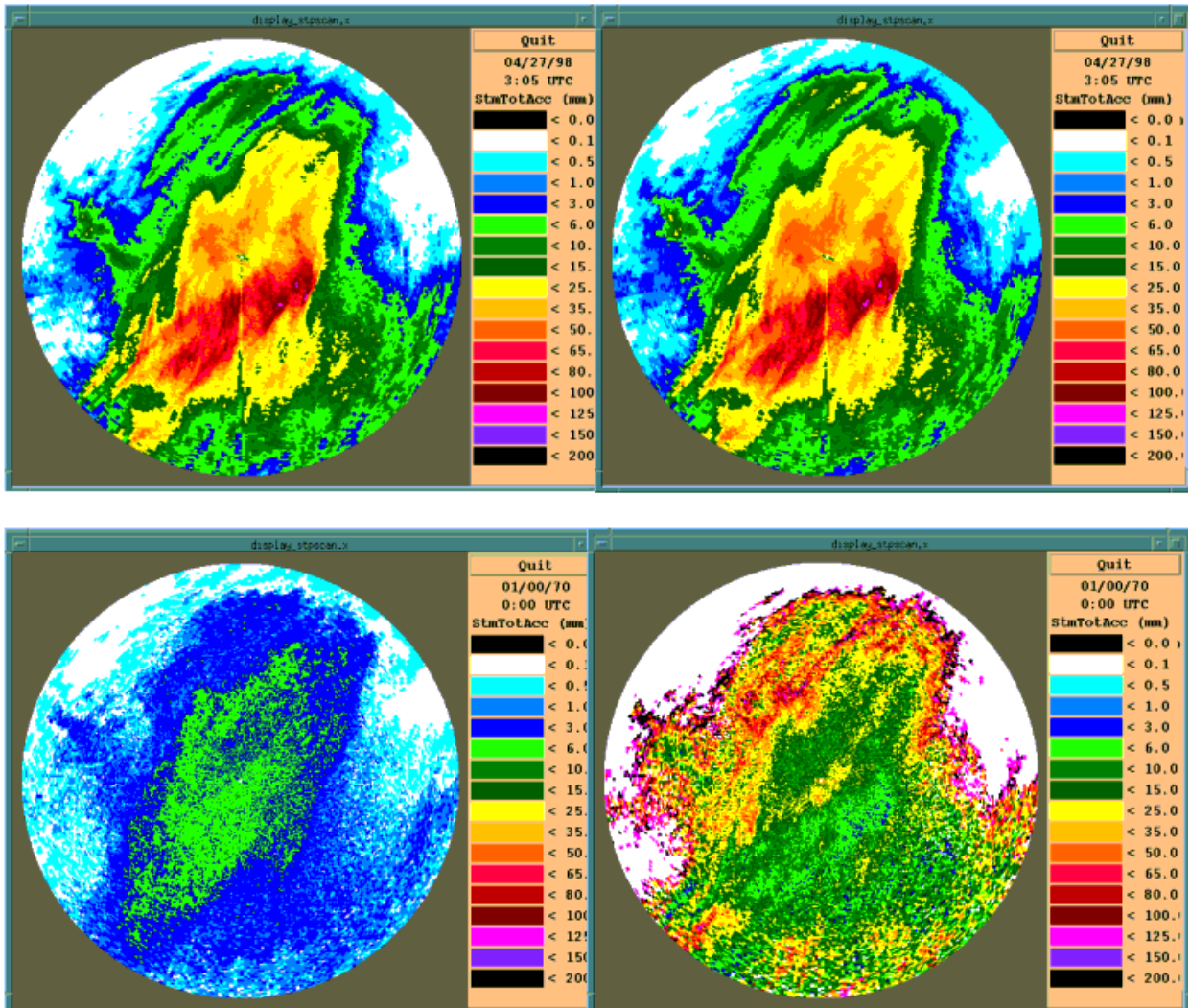


Fig. Figure 3.1: Storm Total Precipitation (STP) products and differences at Twin Lakes, OK for nine-hour period ending 04/27/98 ~03 UTC. Upper left: STP product from PPS algorithm version with the Truncation problem; Upper right: STP product from Prototype PPS algorithm with the truncation problem Corrected; Lower left: Differences between them by amount; Lower right: Differences by percentage (i.e., $((\text{corrected} - \text{truncated}) / \text{truncated}) \times 100$).

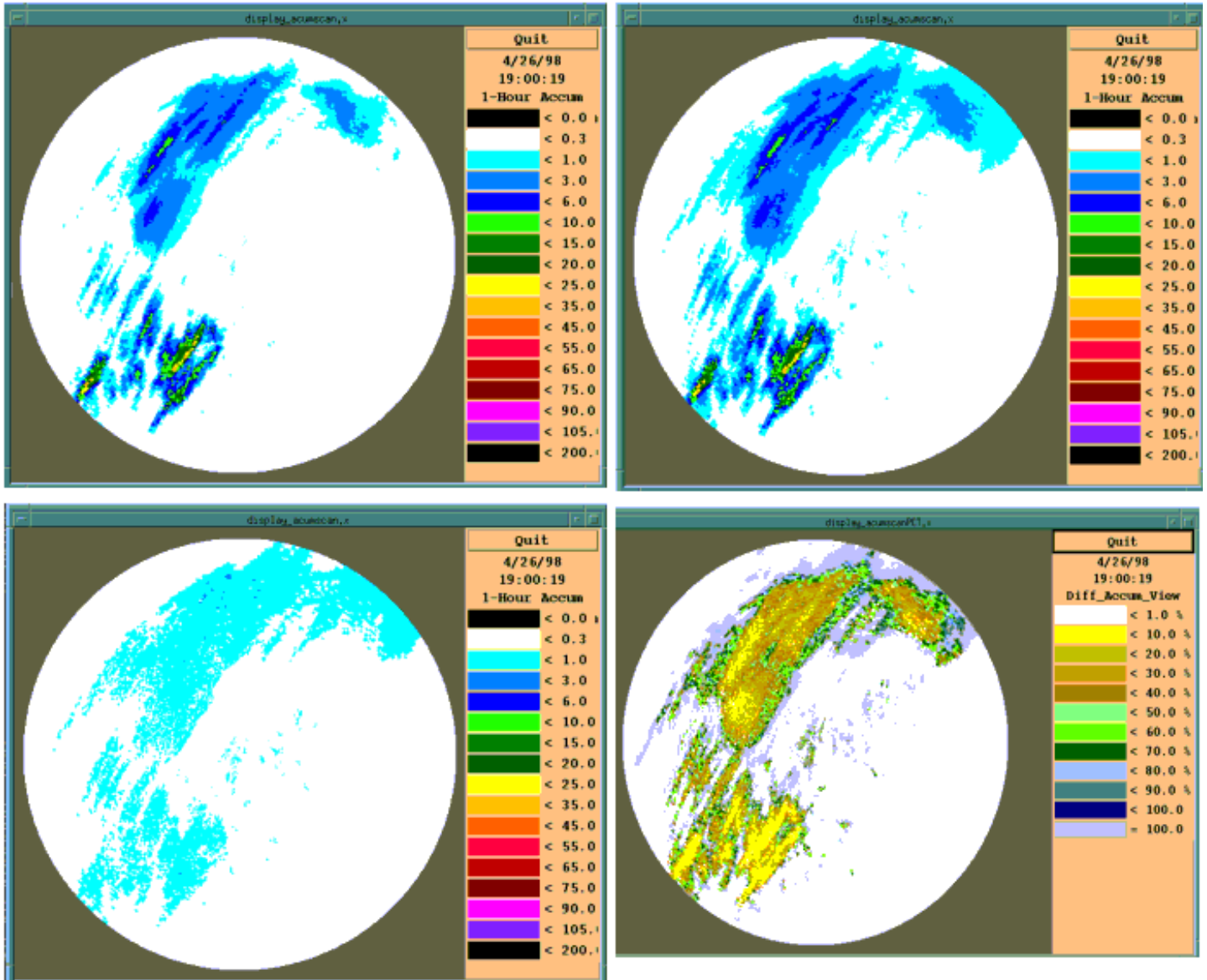


Fig. Figure 3.2-1: One-Hour Precipitation (OHP) products and differences at Twin Lakes, OK for period ending 04/26/98 ~19 UTC. Upper left: OHP product from PPS algorithm version with the Truncation problem; Upper right: OHP product from Prototype PPS algorithm with the truncation problem Corrected; Lower left: Differences between them by amount; Lower right: Differences by percent.

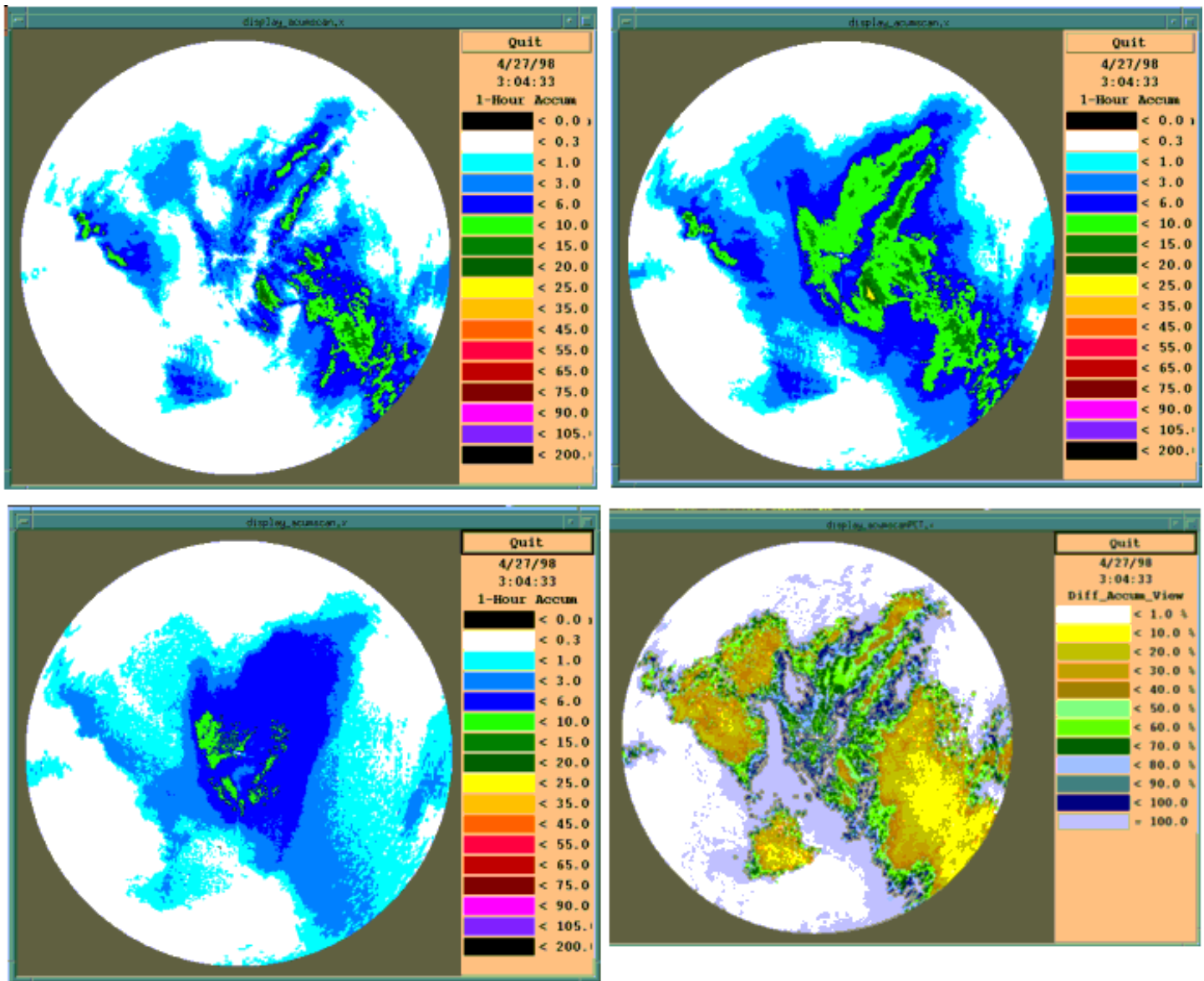


Fig. Figure 3.2-2: One-Hour Precipitation (OHP) products and differences at Twin Lakes, OK for period ending 04/27/98 ~03 UTC. Upper left: OHP product from PPS algorithm version with the Truncation problem; Upper right: OHP product from Prototype PPS algorithm with the truncation problem Corrected; Lower left: Differences between them by a amount; Lower right: Differences by percent.

Houston, TX (HGX) 08/21-24/98: Default Z-R; Default Hail Cap (Revised Alg.)
 1-Hour Gage-Radar analyses 24-Hour Gage-Radar analyses

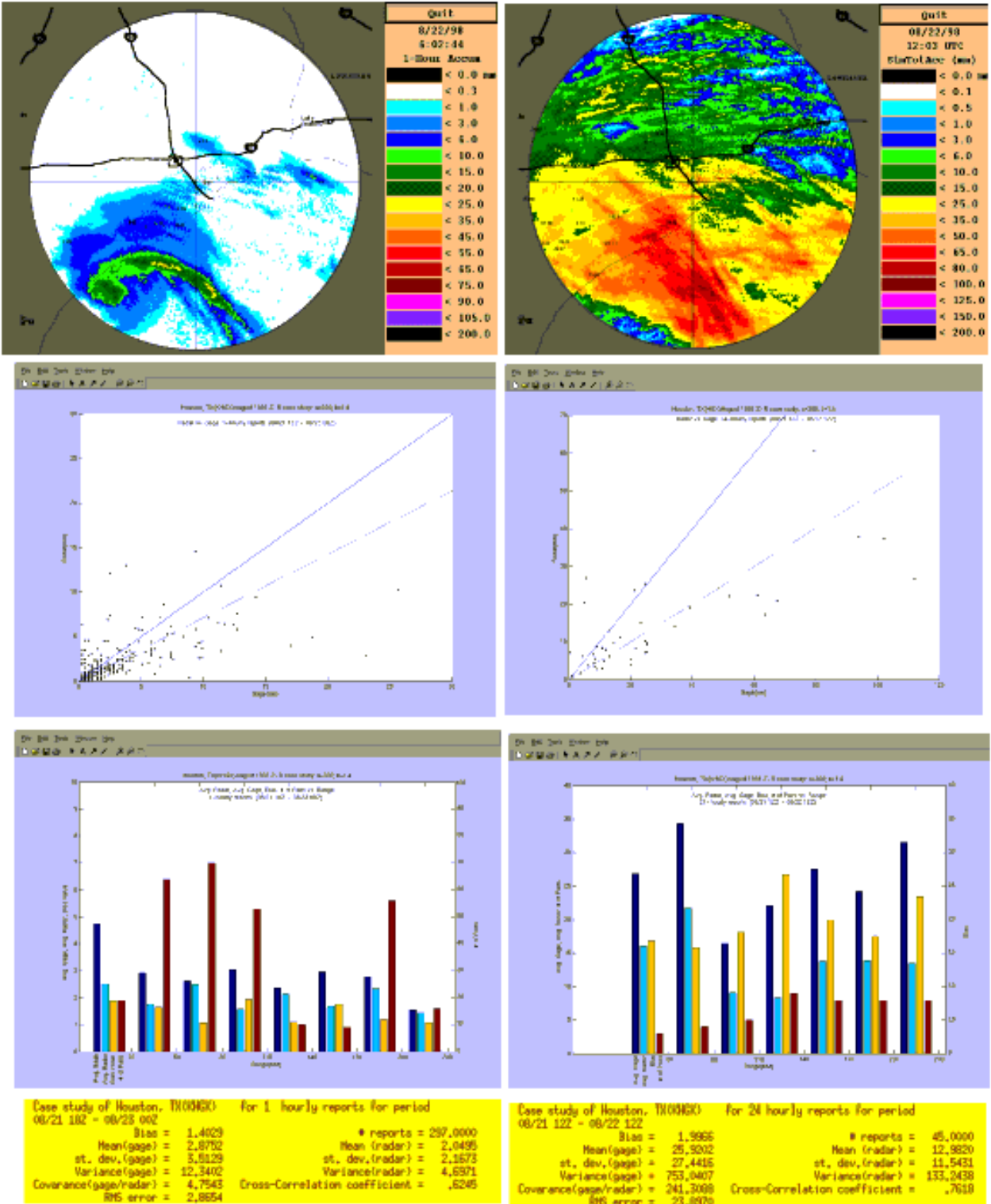


Fig. 3.3A.H: Overview of results from August 21-24 Houston (KHGX) simulation with Revised PPS algorithm, Default Z-R ($a=300$; $b=1.4$) and Default Hail Cap threshold (103.8 mm/hr): Left column: analysis of all 1-hr G-R Pairs for duration of run (i.e., 08/21 18 UTC-08/23 00 UTC); Right column: analysis of 24-hr G-R pairs ending 08/22 12 UTC. Top to bottom (both columns): Accumulation product with rain gage data for matching period superimposed (Left: OHP for indicative hour (i.e., ending 08/22/98 06 UTC); Right: STP for 24 hours); Gage (X) vs. Radar (Y) “Scatter Diagram”; Bias, Avg. Gage, Avg. Radar and # G-R Pairs vs. Range; Summary of Statistics for case. (all accum. units mm)

Houston, TX (HGX) 10/17-19/98: Default Z-R; Default Hail Cap (Revised Alg.)

1-Hour Gage-Radar analyses 24-Hour Gage-Radar analyses

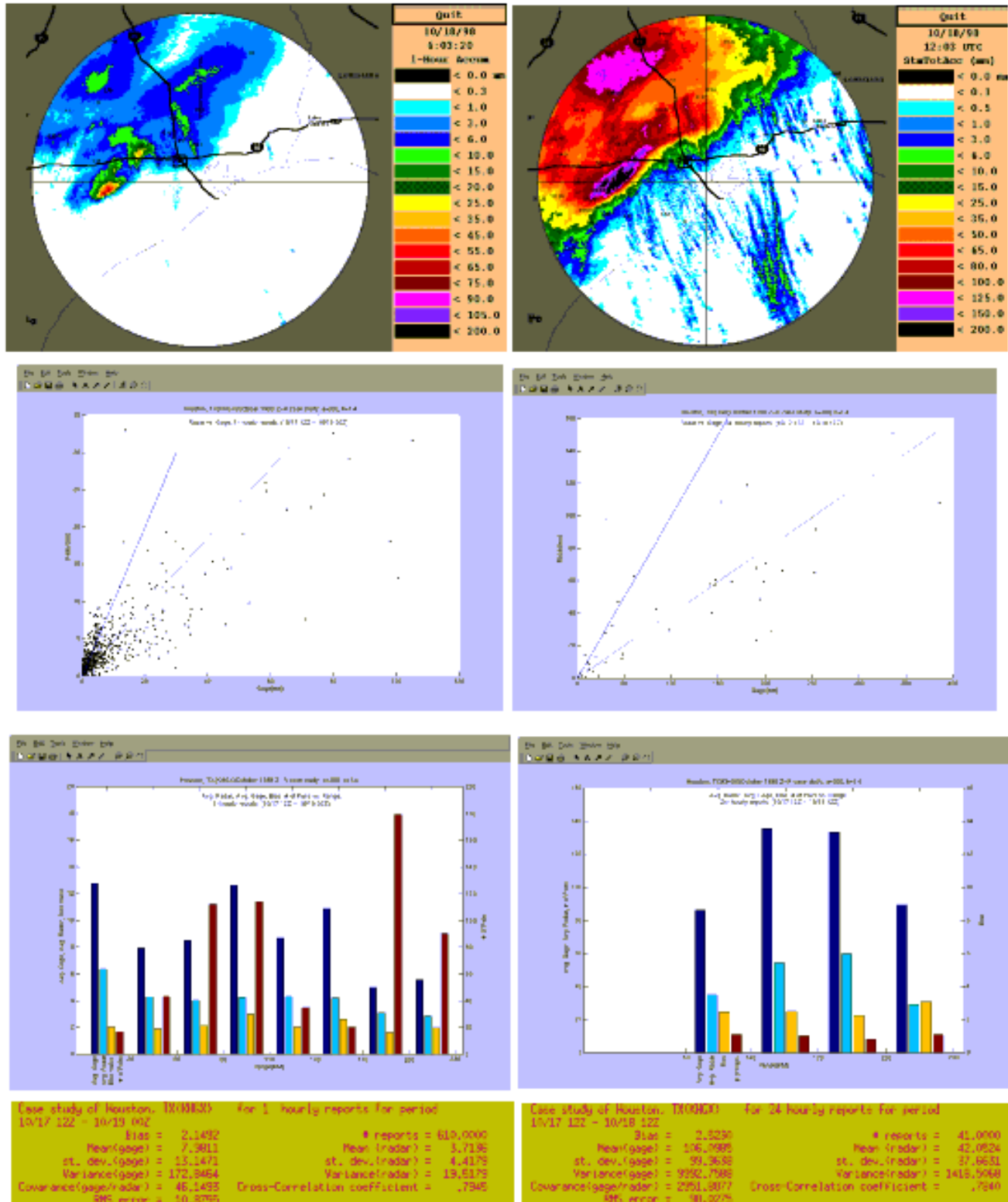


Fig. 3.30.H: Overview of results from October 17-19 Houston (KHGX) simulation with Revised PPS algorithm, Default Z-R (a=300; b=1.4) and Default Hail Cap threshold (103.8 mm/hr): Left column: analysis of all 1-hr G-R Pairs for duration of run (i.e., 10/17 12 UTC - 10/19 00 UTC); Right column: analysis of 24-hr G-R pairs ending 10/18 12 UTC. Top to bottom (both columns): Accumulation product with rain gage data for matching period superimposed (Left: OHP for indicative hour (i.e., ending 10/18/98 06 UTC); Right: STP for 24 hours); Gage (X) vs. Radar (Y) "Scatter Diagram"; Bias, Avg. Gage, Avg. Radar and # G-R Pairs vs. Range; Summary of Statistics for case. (all accum. units mm)

Houston, TX (HGX) 08/21-24/98: Tropical Z-R; Default Hail Cap (Revised Alg.)

1-Hour Gage-Radar analyses

24-Hour Gage-Radar analyses

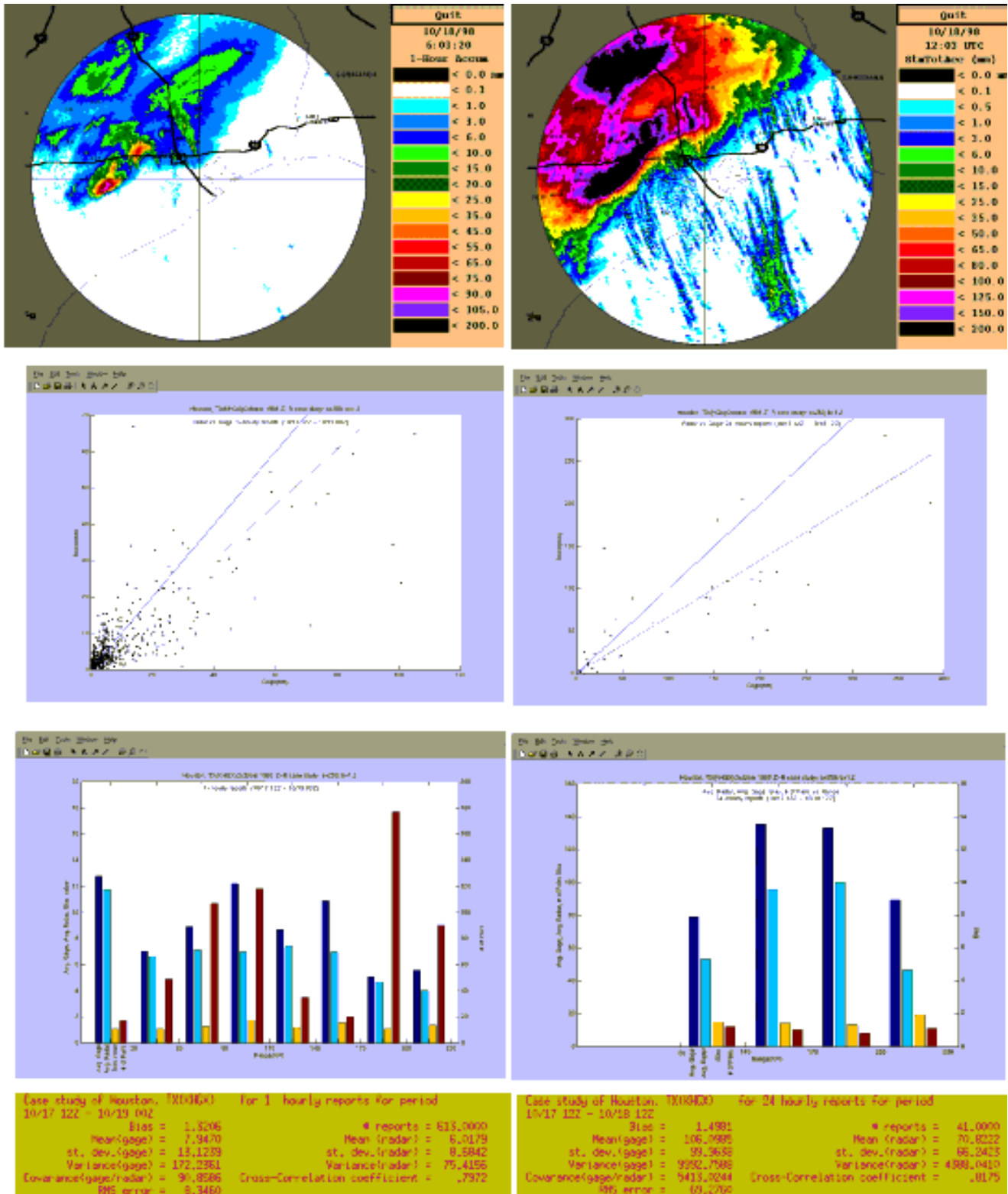


Fig. 3.4A.H: Overview of results from August 21-24 Houston (KHGX) simulation with Revised PPS algorithm, Tropical Z-R ($a=250$; $b=1.2$) and Default Hail Cap threshold (103.8 mm/hr): Left column: analysis of all 1-hr G-R Pairs for duration of run (i.e., 08/21 18 UTC - 08/22 00 UTC); Right column: analysis of 24-hr G-R pairs ending 08/22 12 UTC. Top to bottom (both columns): Accumulation product with rain gage data for matching period superimposed (Left: OHP for indicative hour (i.e., ending 08/22/98 06 UTC); Right: STP for 24 hours); Gage (X) vs. Radar (Y) "Scatter Diagram"; Bias, Avg. Gage, Avg. Radar and # G-R Pairs vs. Range; Summary of Statistics for case. (all accum. units mm)

Houston, TX (HGX) 10/17-19/98: Tropical Z-R; Default Hail Cap (Revised Alg.)

1-Hour Gage-Radar analyses

24-Hour Gage-Radar analyses

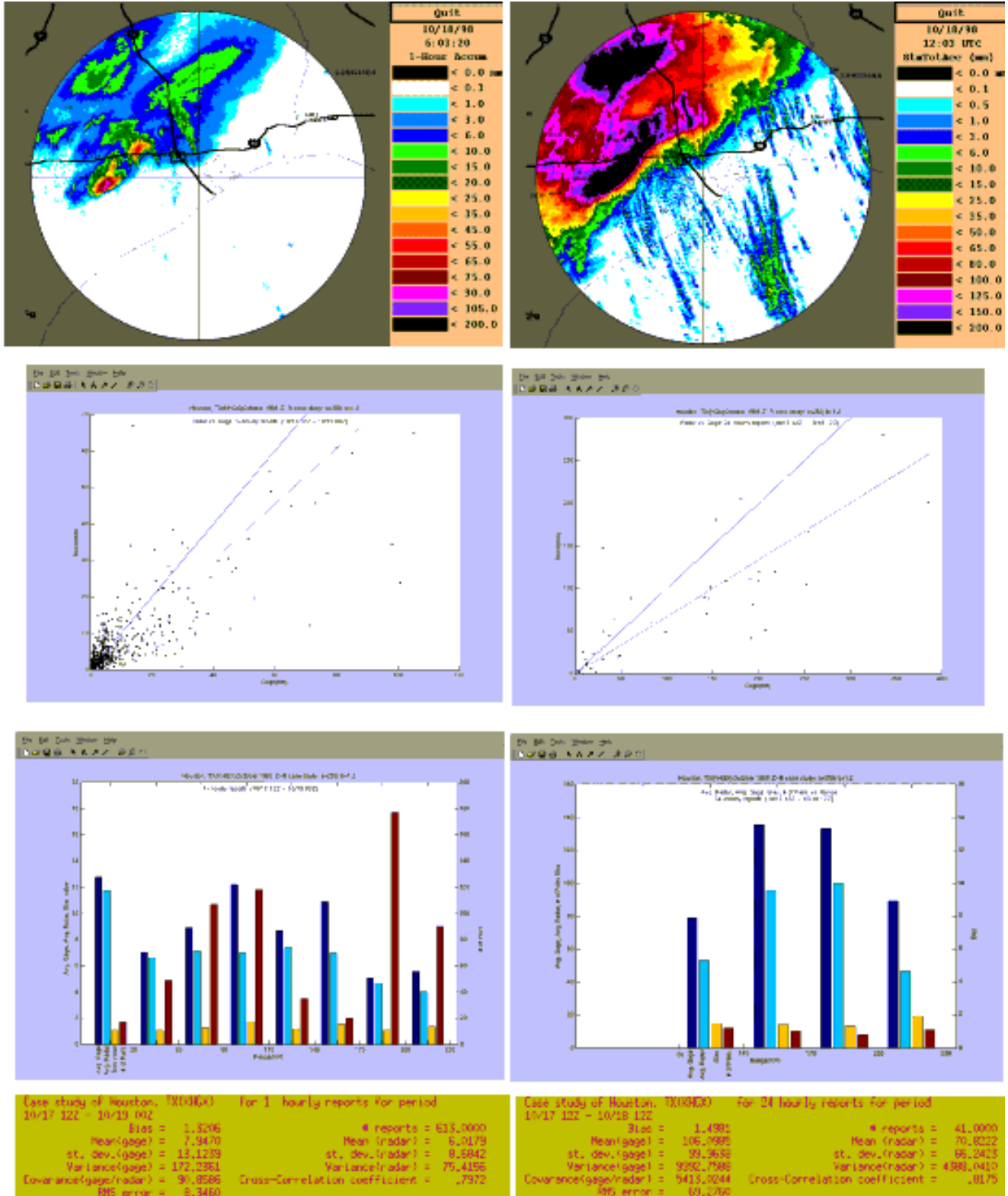


Fig. 3.40.H: Overview of results from October 17-19 Houston (KHGX) simulation with Revised PPS algorithm, Tropical Z-R ($a=250$; $b=1.2$) and Default Hail Cap threshold (103.8 mm/hr): Left column: analysis of all 1-hr G-R Pairs for duration of run (i.e., 10/17 12 UTC - 10/19 00 UTC); Right column: analysis of 24-hr G-R pairs ending 10/18 12 UTC. Top to bottom (both columns): Accumulation product with rain gage data for matching period superimposed (Left: OHP for indicative hour (i.e., ending 10/18/98 06 UTC); Right: STP for 24 hours); Gage (X) vs. Radar (Y) "Scatter Diagram"; Bias, Avg. Gage, Avg. Radar and # G-R Pairs vs. Range; Summary of Statistics for case. (all accum. units mm)

	Houston, TX (HGX): August 21-24 '98 Test Simulations							
	"Default" Z-R (a=300; b=1.4)				"Tropical" Z-R (a=250; b=1.2)			
	1-hr. Reports: (~30 hrs): (8/21 18Z - 8/23 00Z)		24-hr. Reports: (8/21 12Z - 8/22 12Z)		1-hr. Reports: (~30 hrs): (8/21 18Z - 8/23 00Z)		24-hr. Reports: (8/21 12Z - 8/22 12Z)	
Statistical Measure	Original Algorithm	Corrected Algorithm	Original Algorithm	Corrected Algorithm	Original Algorithm	Corrected Algorithm	Original Algorithm	Corrected Algorithm
No. G-R Pairs	197	297 (197)	45	45 (^o)	216	302 (216)	45	45 (^o)
Mean Gage (mm)	3.61	2.88 (3.61)	25.92	25.92 (^o)	3.49	2.83 (3.49)	25.92	25.92 (^o)
Mean Radar (mm)	1.77 (-33.5%)	2.05 (2.66)	11.10 (-14.5%)	12.98 (^o)	3.09 (-25.9%)	3.22 (4.17)	19.94 (-9.8%)	22.10 (^o)
Bias	2.04	1.40 (1.36)	2.34	2.00 (^o)	1.13	0.88 (0.84)	1.30	1.17 (^o)
Corr. Coefficient	0.52	0.62 (0.58)	0.75	0.76 (^o)	0.56	0.63 (0.60)	0.73	0.75 (^o)
RMS Error	3.87	2.87 (3.38)	25.59	23.90 (^o)	3.95	3.33 (3.86)	19.79	18.70 (^o)

Table 3.1A: Comparative statistical results from Original vs. Corrected algorithm runs for various simulations of Aug. 21-24 '98 case. Parenthesized results are for analyses with same G-R Pairs used in Corrected algorithm runs as Original algorithm runs.

Houston, TX (HGX): October 17-19 '98 Test Simulations									
“Default” Z-R (a=300; b=1.4)					“Tropical” Z-R (a=250; b=1.2)				
		1-hr. Reports: (~36 hrs): (10/17 12Z - 10/19 00Z)		24-hr. Reports: (10/17 12Z - 10/18 12Z)		1-hr. Reports: (~36 hrs): (10/17 12Z - 10/19 00Z)		24-hr. Reports: (10/17 12Z - 10/18 12Z)	
Statistical Measure	Original Algorithm	Corrected Algorithm	Original Algorithm	Corrected Algorithm	Original Algorithm	Corrected Algorithm	Original Algorithm	Corrected Algorithm	
No. G-R Pairs	345	610 (345)	38	41 (38)	396	613 (396)	40	41 (40)	
Mean Gage (mm)	11.54	7.98 (11.54)	114.20	106.10 (114.20)	10.84	7.95 (10.84)	108.53	106.10 (108.53)	
Mean Radar (mm)	3.25 (-39.0%)	3.71 (5.33)	39.40 (-13.1%)	42.05 (45.35)	5.99 (-28.8%)	6.02 (8.41)	67.15 (-7.5%)	70.82 (72.59)	
Bias	3.55	2.15 (2.16)	2.90	2.52 (2.52)	1.81	1.32 (1.29)	1.62	1.50 (1.50)	
Corr. Coefficient	0.74	0.79 (0.78)	0.78	0.78 (0.76)	0.75	0.80 (0.78)	0.82	0.82 (0.81)	
RMS Error	15.43	10.88 (13.92)	106.34	98.03 (101.91)	11.48	8.35 (10.17)	73.09	69.28 (70.12)	

Table 3.10: Comparative statistical results from Original vs. Corrected algorithm runs for various simulations of Oct. 17-19 '98 case. Parenthesized results are for analyses with same G-R Pairs used in Corrected algorithm runs as Original algorithm runs.

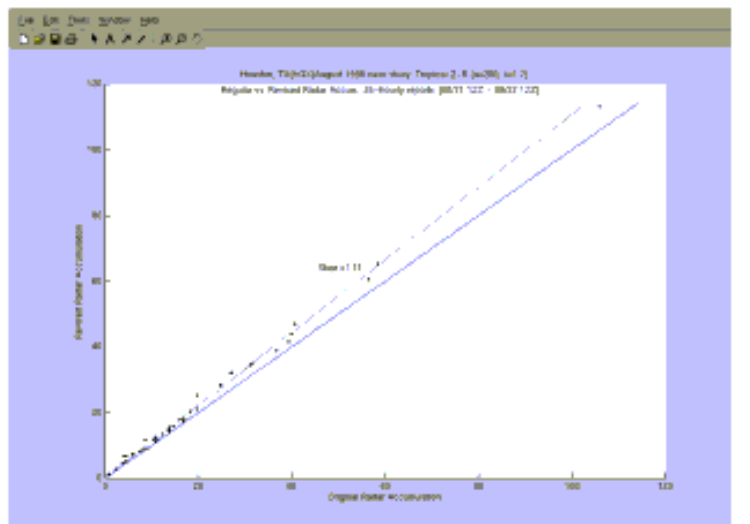
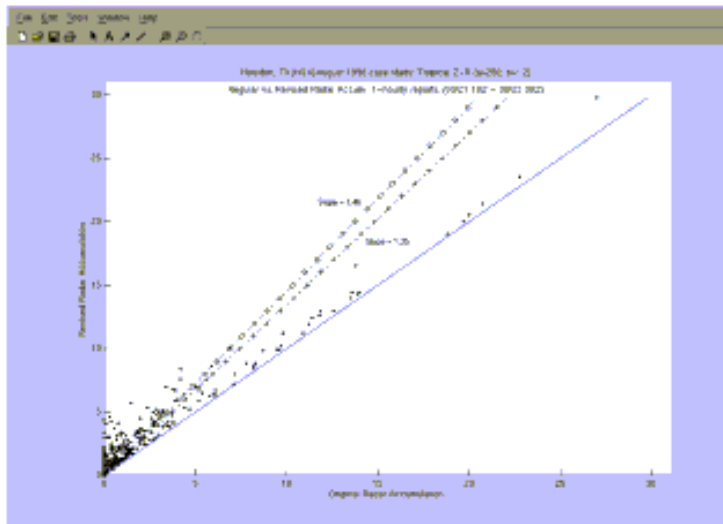
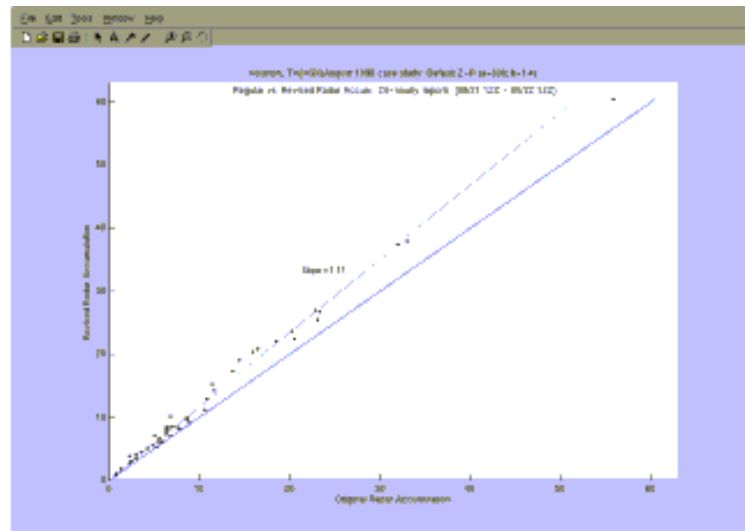
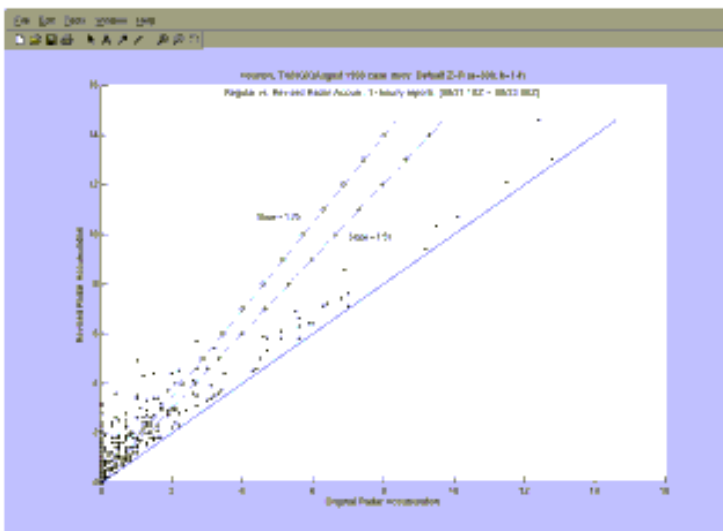


Fig. 3.5A: Scatter diagram of Radar vs. Radar accumulations for Original (X-axis) vs. Revised (Y-axis) algorithm simulations for August 21-24 '98 event. Upper left: Default Z-R parameters, One-hour accumulations; upper right: Default Z-R parameters, 24-hour accumulations; lower left: Tropical Z-R parameters, One-hour accumulations; lower right: Tropical Z-R parameter, 24-hour accumulations. Lines with circles: best fit lines including Gage-Radar Pairs with one member (i.e., accumulation from Original algorithm run) zero; lines with X's: best fit lines including only Gage-Radar Pairs with both members non-zero.

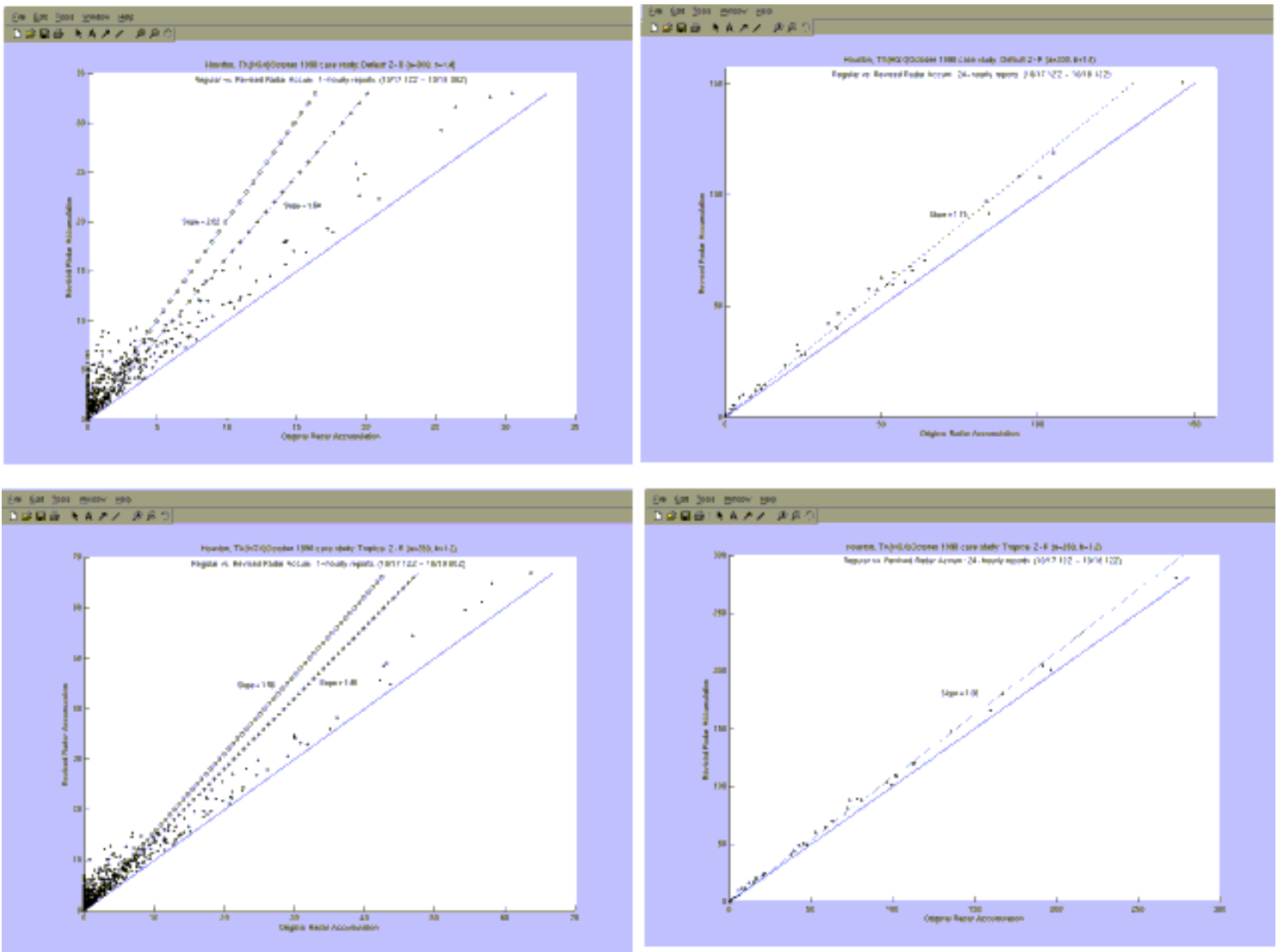


Fig. 3.50: Scatter diagram of Radar vs. Radar accumulations for Original (X-axis) vs. Revised (Y-axis) algorithm simulations for October 17-19 '98 event. Upper left: Default Z-R parameters, One-hour accumulations; upper right: Default Z-R parameters, 24-hour accumulations; lower left: Tropical Z-R parameters, One-hour accumulations; lower right: Tropical Z-R parameter, 24-hour accumulations. Lines with circles: best fit lines including Gage-Radar Pairs with one member (i.e., accumulation from Original algorithm run) zero; lines with X's: best fit lines including only Gage-Radar Pairs with both members non-zero.

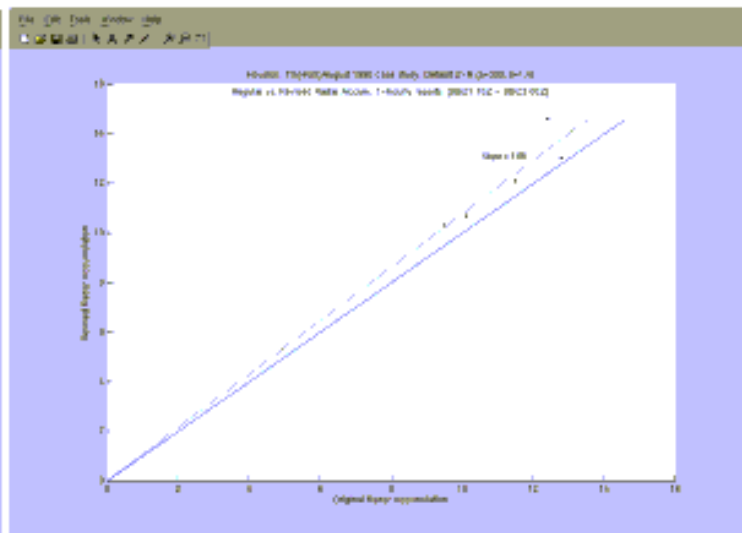
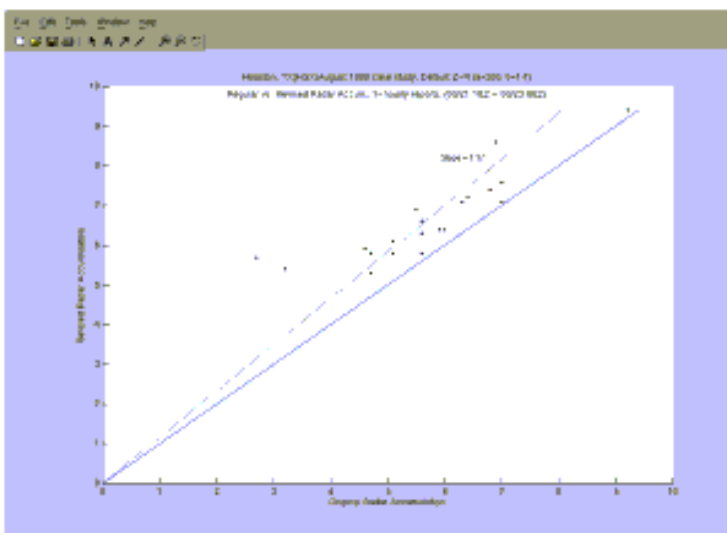
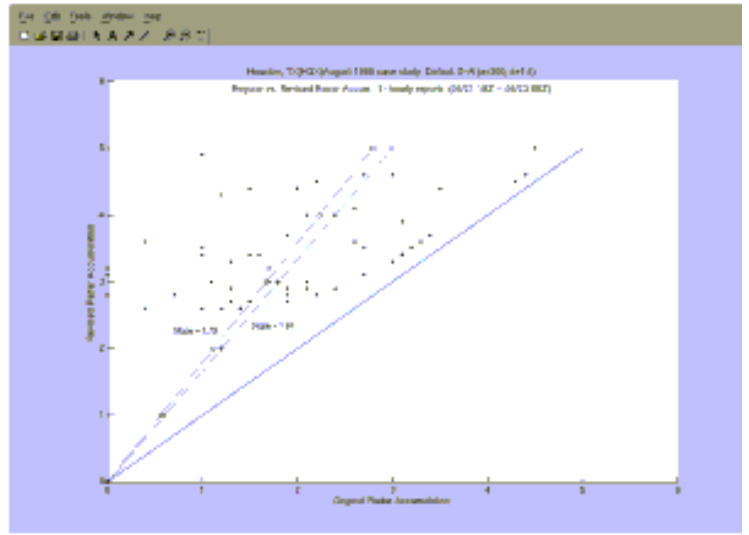
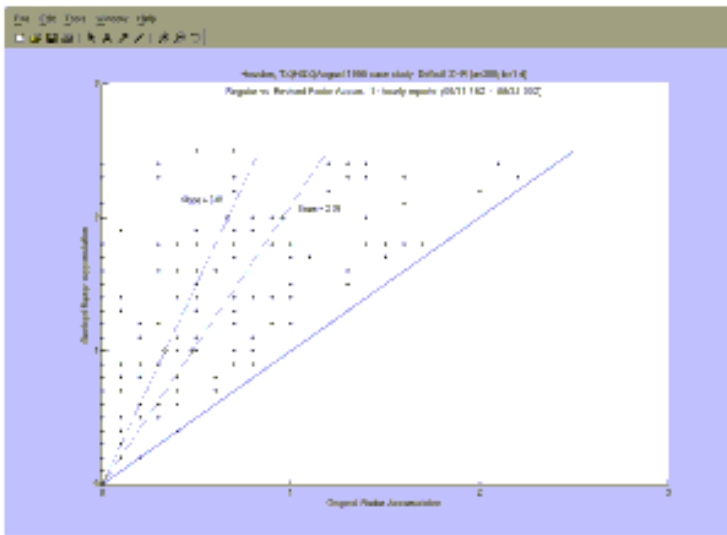


Fig. 3.6A: Scatter diagrams of One-hour Radar vs. Radar accumulations for Original (X-axis) vs. Revised (Y-axis) algorithm simulations from Default Z-R parameters for August 21-24 '98 event, quantized by amount. Upper left: accumulations (in Revised runs) in range 0.0 - 2.5 mm; upper right: 2.5 - 5.0 mm; lower left: 5.0 - 10.0 mm; lower right: 10.0+ mm.

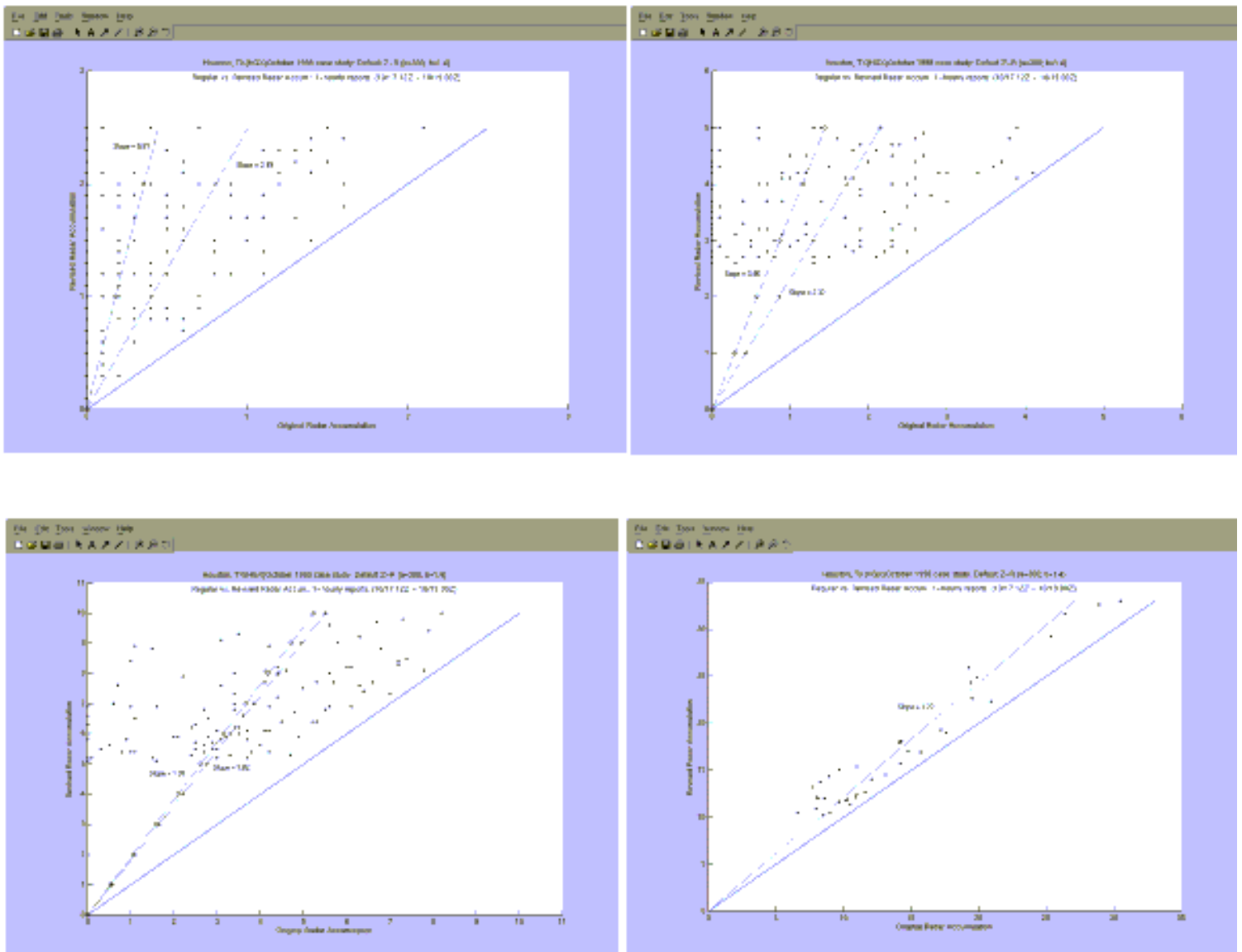


Fig. 3.6O: Scatter diagrams of One-hour Radar vs. Radar accumulations for Original (X-axis) vs. Revised (Y-axis) algorithm simulations from Default Z-R parameters for October 17-19 '98 event, quantized by amount. Upper left: accumulations (in Revised runs) in range 0.0 - 2.5 mm; upper right: 2.5 - 5.0 mm; lower left: 5.0 - 10.0 mm; lower right: 10.0+ mm.