AMSU/HSB Precipitation Rate Validation Update

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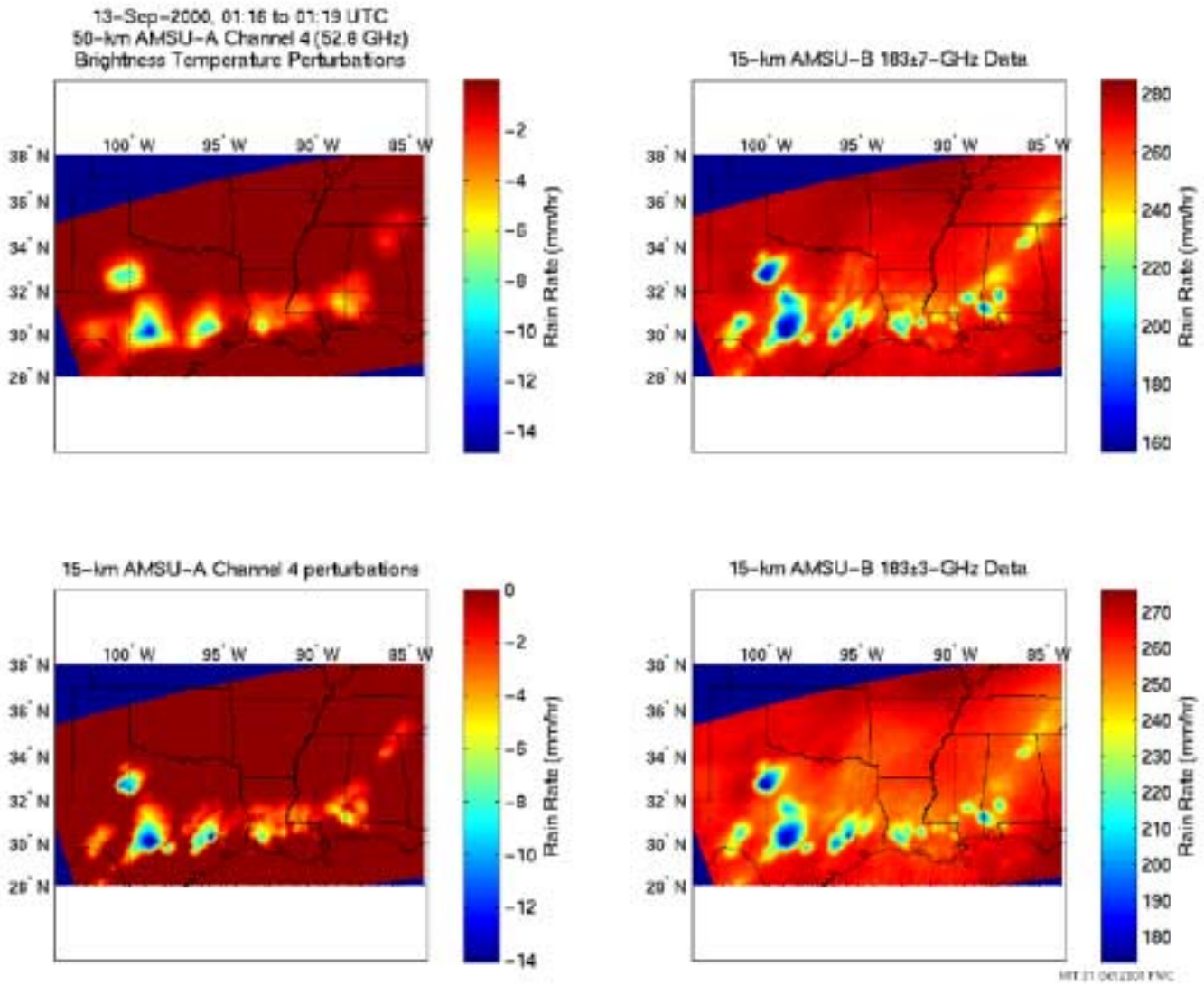
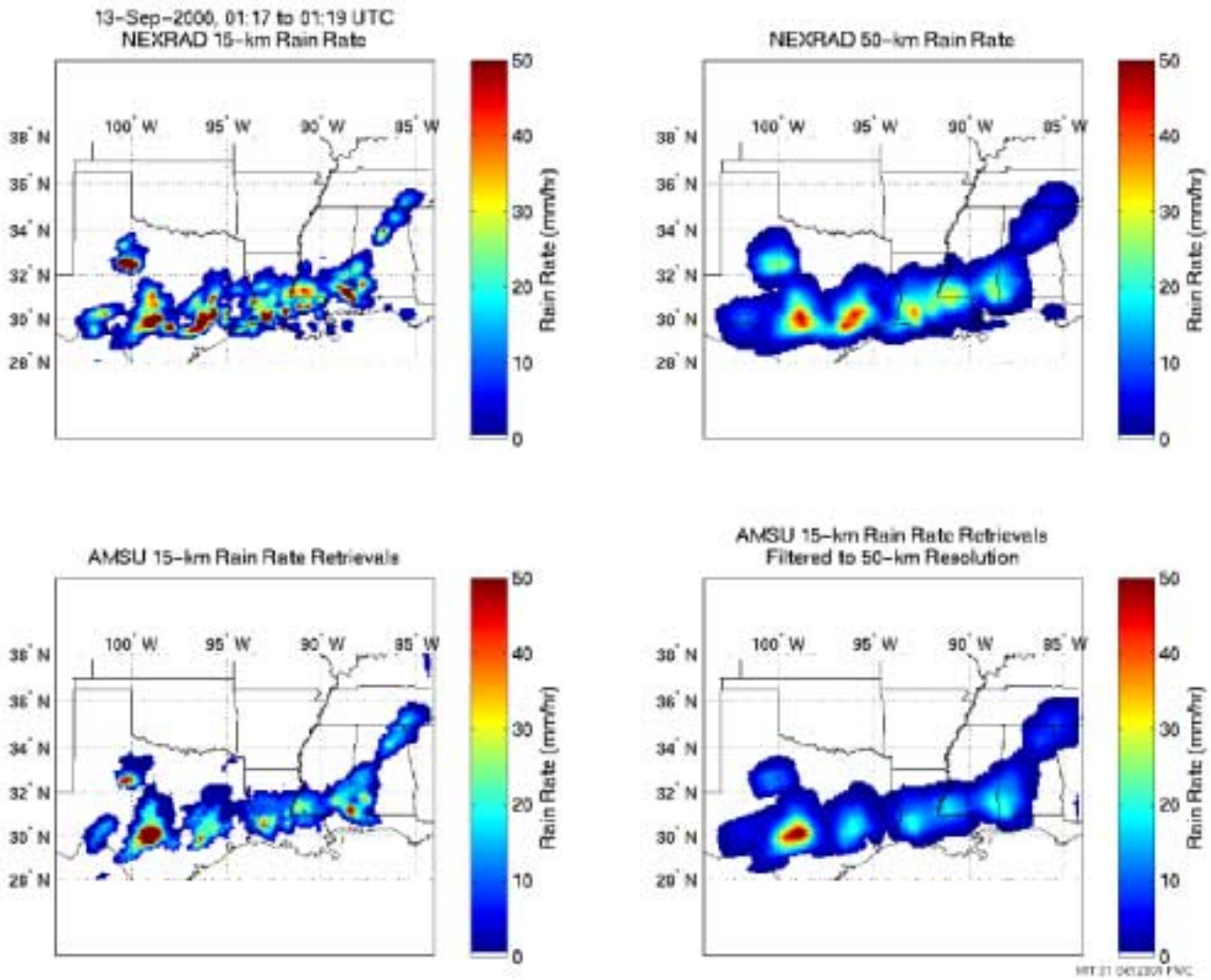
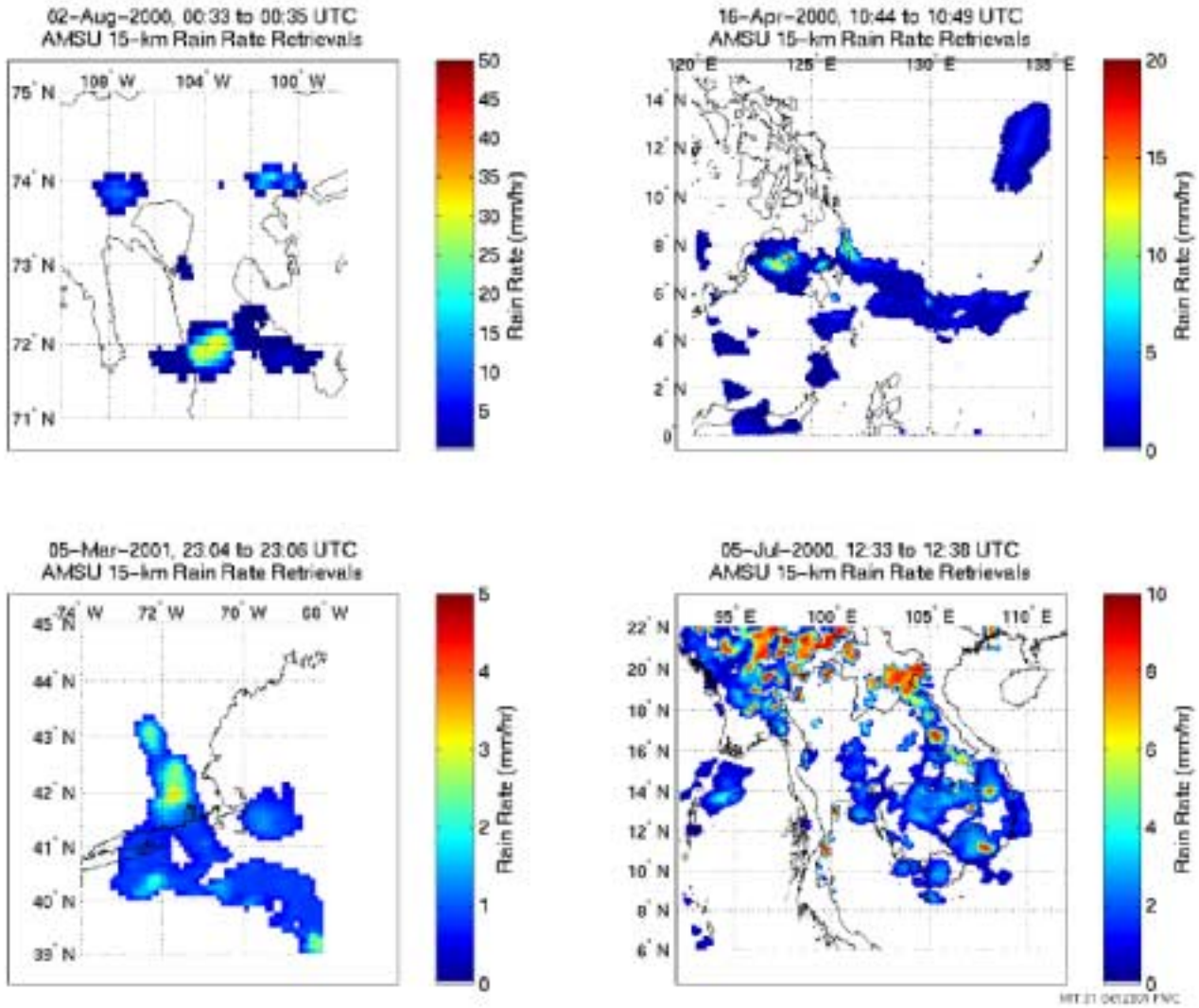
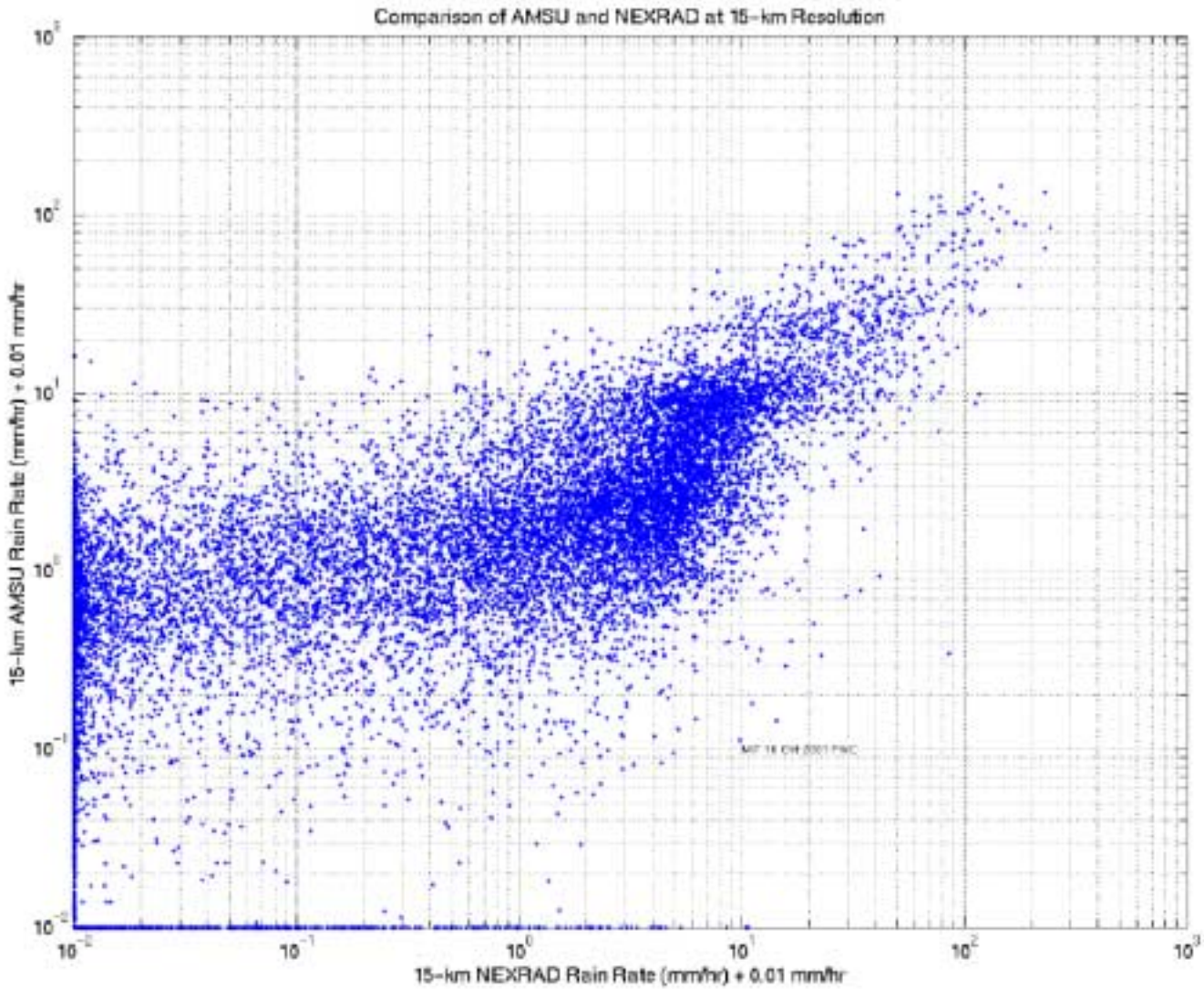
OUTLINE

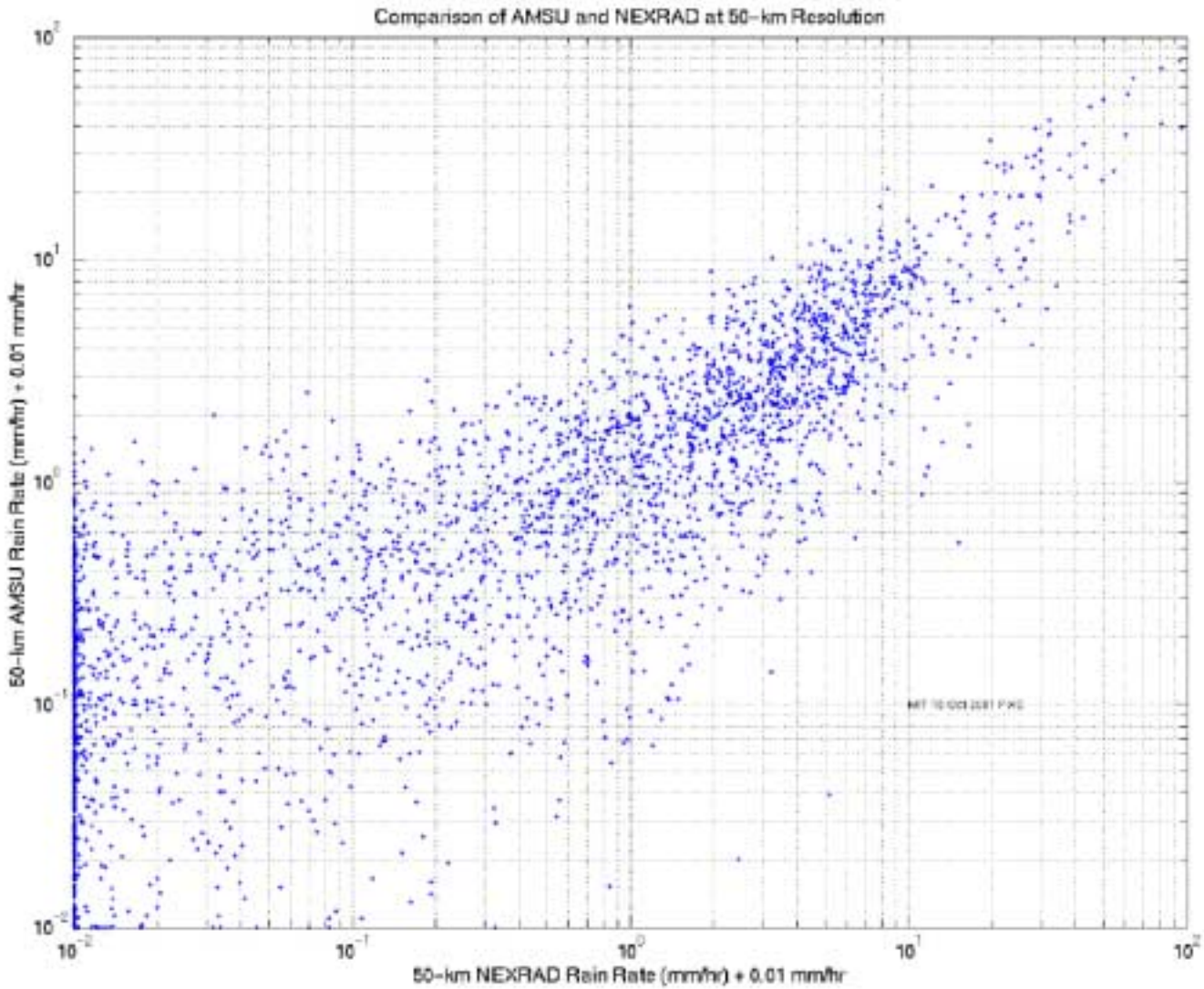
- Obtaining 15-km resolution using 50-km data
- Scatter plots: AMSU vs NEXRAD rain-rate retrievals
- Representative rain-rate retrieval images
- Observed cumulative rain-rate distributions: AMSU vs GATE

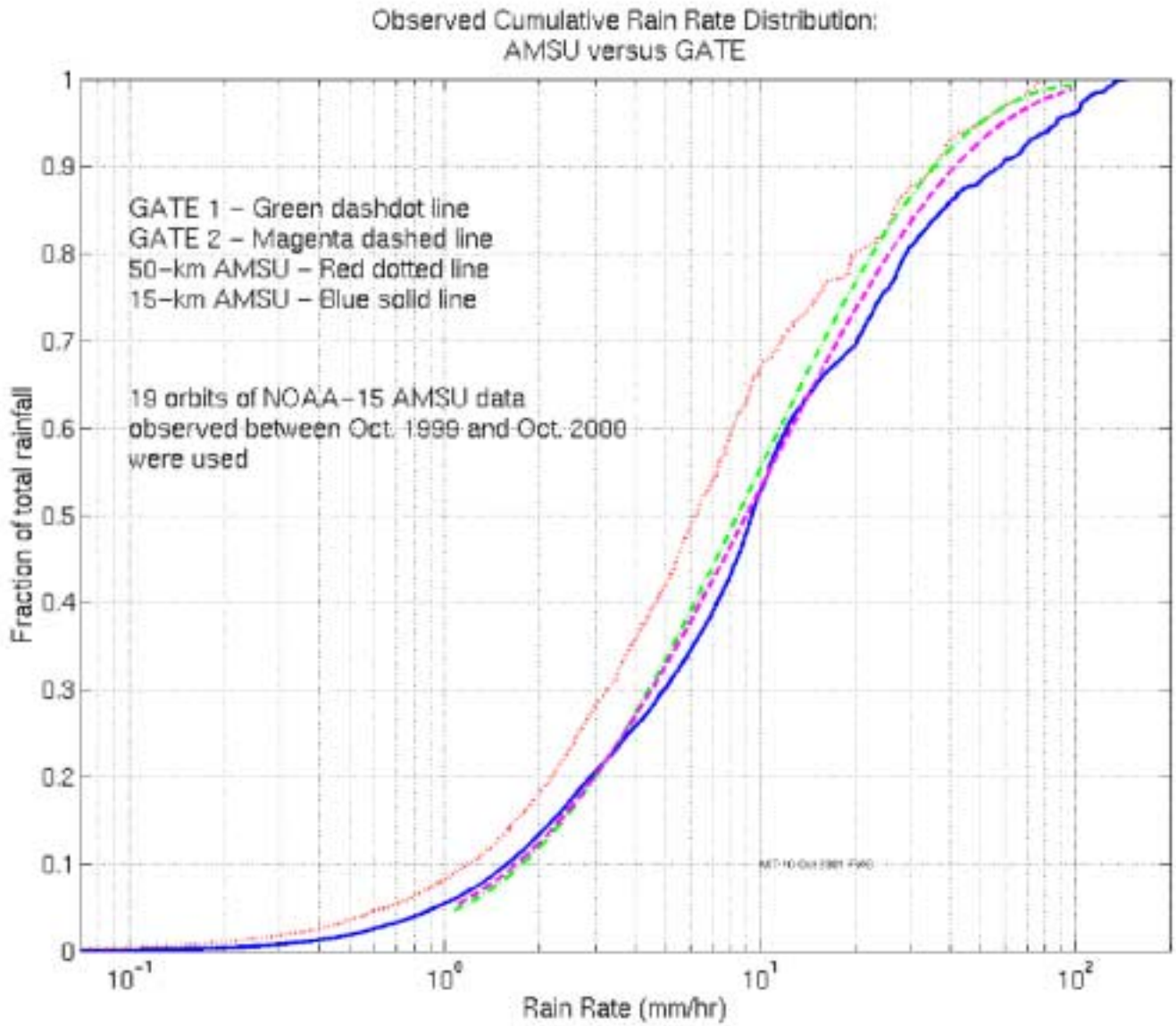

13-Sep-2000, 01:16 to 01:19 UTC
50-km AMSU-A Channel 4 (52.8 GHz)
Brightness Temperature Perturbations
15-km AMSU-B 183±7-GHz Data
15-km AMSU-A Channel 4 perturbations
15-km AMSU-B 183±3-GHz Data
100° W
95° W
90° W
85° W
38° N
36° N
34° N
32° N
30° N
28° N
Rain Rate (mm/hr)


13-Sep-2000, 01:17 to 01:19 UTC
NEXRAD 15-km Rain Rate
NEXRAD 50-km Rain Rate
AMSU 15-km Rain Rate Retrievals
AMSU 15-km Rain Rate Retrievals
Filtered to 50-km Resolution
100° W
95° W
90° W
85° W
38° N
36° N
34° N
32° N
30° N
28° N
Rain Rate (mm/hr)
0
10
20
30
40
50


02-Aug-2000, 00:33 to 00:35 UTC
AMSU 15-km Rain Rate Retrievals
108° W
104° W
100° W
75° N
74° N
73° N
72° N
71° N
Rain Rate (mm/hr)
50
45
40
35
30
25
20
15
10
5
16-Apr-2000, 10:44 to 10:49 UTC
AMSU 15-km Rain Rate Retrievals
120° E
125° E
130° E
135° E
14° N
12° N
10° N
8° N
6° N
4° N
2° N
0°
Rain Rate (mm/hr)
20
15
10
5
0
05-Mar-2001, 23:04 to 23:06 UTC
AMSU 15-km Rain Rate Retrievals
74° W
72° W
70° W
68° W
45° N
44° N
43° N
42° N
41° N
40° N
39° N
Rain Rate (mm/hr)
5
4
3
2
1
0
05-Jul-2000, 12:33 to 12:38 UTC
AMSU 15-km Rain Rate Retrievals
95° E
100° E
105° E
110° E
22° N
20° N
18° N
16° N
14° N
12° N
10° N
8° N
6° N
Rain Rate (mm/hr)
10
8
6
4
2
0


Comparison of AMSU and NEXRAD at 15-km Resolution
15-km AMSU Rain Rate (mm/hr) + 0.01 mm/hr
15-km NEXRAD Rain Rate (mm/hr) + 0.01 mm/hr


Comparison of AMSU and NEXRAD at 50-km Resolution
50-km AMSU Rain Rate (mm/hr) + 0.01 mm/hr
50-km NEXRAD Rain Rate (mm/hr) + 0.01 mm/hr
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-2}


Observed Cumulative Rain Rate Distribution:
AMSU versus GATE
GATE 1 – Green dashdot line
GATE 2 – Magenta dashed line
50-km AMSU – Red dotted line
15-km AMSU – Blue solid line
19 orbits of NOAA-15 AMSU data
observed between Oct. 1999 and Oct. 2000
were used
Fraction of total rainfall
Rain Rate (mm/hr)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
10^{-1}
10^{0}
10^{1}
10^{2}