CLEAR FLAG

PURPOSES OF CLEAR FLAG

- START UP IDENTIFICATION TO DETERMINE CHANNEL FREQUENCIES, SRF'S
  - SHOULD NOT INVOLVE RADIATIVE TRANSFER CALCULATIONS, RETRIEVALS
  - SHOULD NOT PRODUCE FALSE CLEAR
  - % YIELD LESS IMPORTANT

- IDENTIFICATION OF CASES TO BE USED BY DATA ASSIMILATORS
  - SHOULD BE FAST IF DONE FOR REAL TIME USE
  - FALSE CLEAR CASES SHOULD NOT HAVE LARGE ERRORS
  - MAXIMIZED YIELD IS BETTER TO SHOW IMPACT

CURRENT CLEAR FLAG

1) WE LOOK AT EIGENVALUES OF AFTER INITIAL CLOUD CLEARING (BEFORE REGRESSION)

$\Delta R_{I,K} = \overline{R}_I - R_{I,K}$ N IS CHANNEL NOISE COVARIANCE

CALL CASE CLOUDY IF $\lambda_{MAX} > \lambda_{THRESHOLD}$

$\lambda_{THRESHOLD}$ = 50 FOR OCEAN, AND 100 FOR LAND

ALLOWS FOR MORE SCENE VARIABILITY OVER LAND BECAUSE OF MORE SURFACE VARIABILITY

THIS TEST DOES NOT INVOLVE RETRIEVALS AND IS QUICK

PROBLEM WITH OVERCAST CASES

NEED TO COMPARE OBSERVED WINDOW RADIANCES WITH VALUES COMPUTED FROM MICROWAVE RETRIEVAL

2) WE ALSO LOOK AT INITIAL RETRIEVED CLOUD FRACTION (BEFORE REGRESSION)

CALL CASE CLOUDY IF $\alpha > 2\%$

THIS TEST IS FAST AND IMPROVES REJECTION OF FALSE CLEAR

THIS IS NOT GOOD FOR STARTUP IDENTIFICATION – INVOLVES RETRIEVALS

CRITERIA DETERMINED FROM SEVEN GRANULES CONTAINING MANY CLEAR CASES

SEVEN GRANULE CLEAR FLAG STATISTICS

CASES WHICH ARE "CLEAR" $\alpha_{TRUE} < 2\%$

GRANULE	CLEAR WITH α_{TEST} NUMBER	$\bar{\alpha}$	CLEAR WITHOUT α_{TEST} NUMBER	$\bar{\alpha}$	ACTUALLY CLEAR NUMBER	$\bar{\alpha}$
84 OCEAN	120	0.39	239	0.75	265	0.74
104 ANTARCTICA	1	0.30	79	0.44	544	0.24
109 EAST AFRICA	242	0.50	274	0.52	358	0.54
151 AUSTRALIA	31	0.32	63	0.46	180	0.42
223 OCEAN	182	0.23	364	0.49	409	0.52
231 EAST AFRICA	97	0.35	131	0.30	234	0.44
ALL 7 GRANULES	673(34%)	0.38	1150(58%)	0.52	1990	0.44

CASES WHICH ARE "CLOUDY" $\alpha_{TRUE} > 2\%$

84 OCEAN	4	3.24	295	5.16	632	12.99
104 ANTARCTICA	1	2.15	19	4.96	469	20.10
109 EAST AFRICA	47	3.65	73	7.20	498	25.04
151 AUSTRALIA	3	2.95	26	7.50	509	33.82
223 OCEAN	7	3.38	220	5.49	745	23.53
231 EAST AFRICA	33	5.34	40	5.38	565	35.73
ALL 7 GRANULES	98(2.8%)	4.16	673(20%)	5.59	3419	24.88
ALL CASES	768	0.85	1823	2.39	5409	15.89

NEW SIMULATION 1 SCAN LINE PER GRANULE STATISTICS

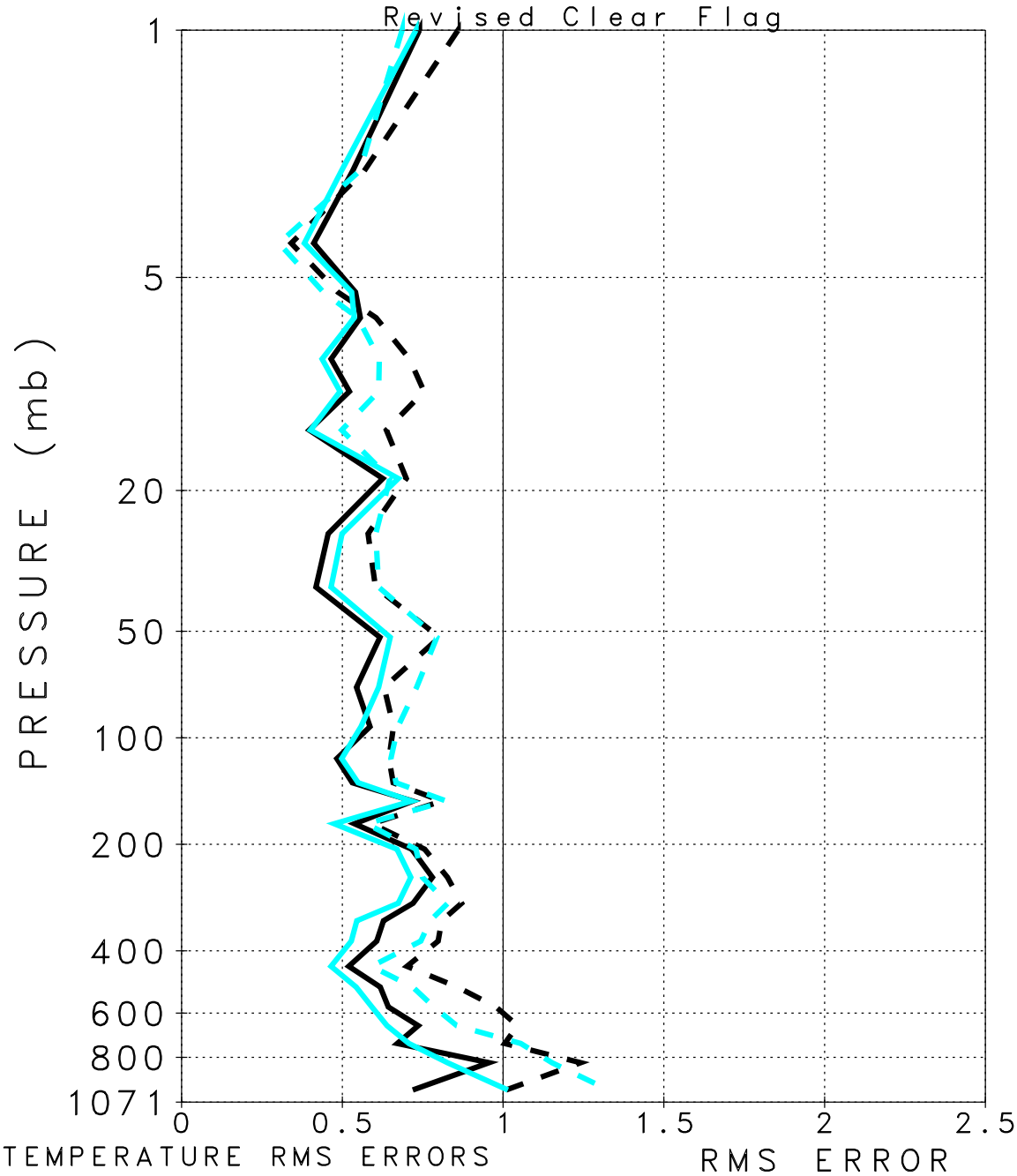
	CLEAR WITH $\alpha < 2\%$		CLEAR WITH $\alpha < 10\%$		CLEAR WITHOUT α_{TEST}		TOTAL CASES	
	NUMBER	$\bar{\alpha}$	NUMBER	$\bar{\alpha}$	NUMBER	$\bar{\alpha}$	NUMBER	$\bar{\alpha}$
OCEAN $\lambda > 80$								
CASES WHICH ARE "CLEAR" $\alpha_{TRUE} < 2\%$								
	80	0.21	126	0.41	256	0.49	322	0.56
CASES WHICH ARE "CLOUDY" $\alpha_{TRUE} < 2\%$								
	7	3.16	54	4.70	269	7.18	2558	35.37
ALL CASES								
	87	0.45	180	1.70	525	3.92	2880	31.48
LAND $\lambda > 200$								
CASES WHICH ARE CLEAR								
	80	0.37	109	0.39	220	0.37	285	0.42
CASES WHICH ARE CLOUDY								
	20	4.68	37	5.60	117	7.96	904	34.74
ALL CASES								
	100	1.24	146	1.71	337	3.01	1189	26.51
LAND/OCEAN								
ALL CASES								
	187	0.87	326	1.70	862	3.56	4069	30.03

February Simulation of December 15, 2000

CASE 7 and 8

LAYER MEAN RMS TEMPERATURE ERRORS (°C)

Revised Clear Flag



TEMPERATURE RMS ERRORS

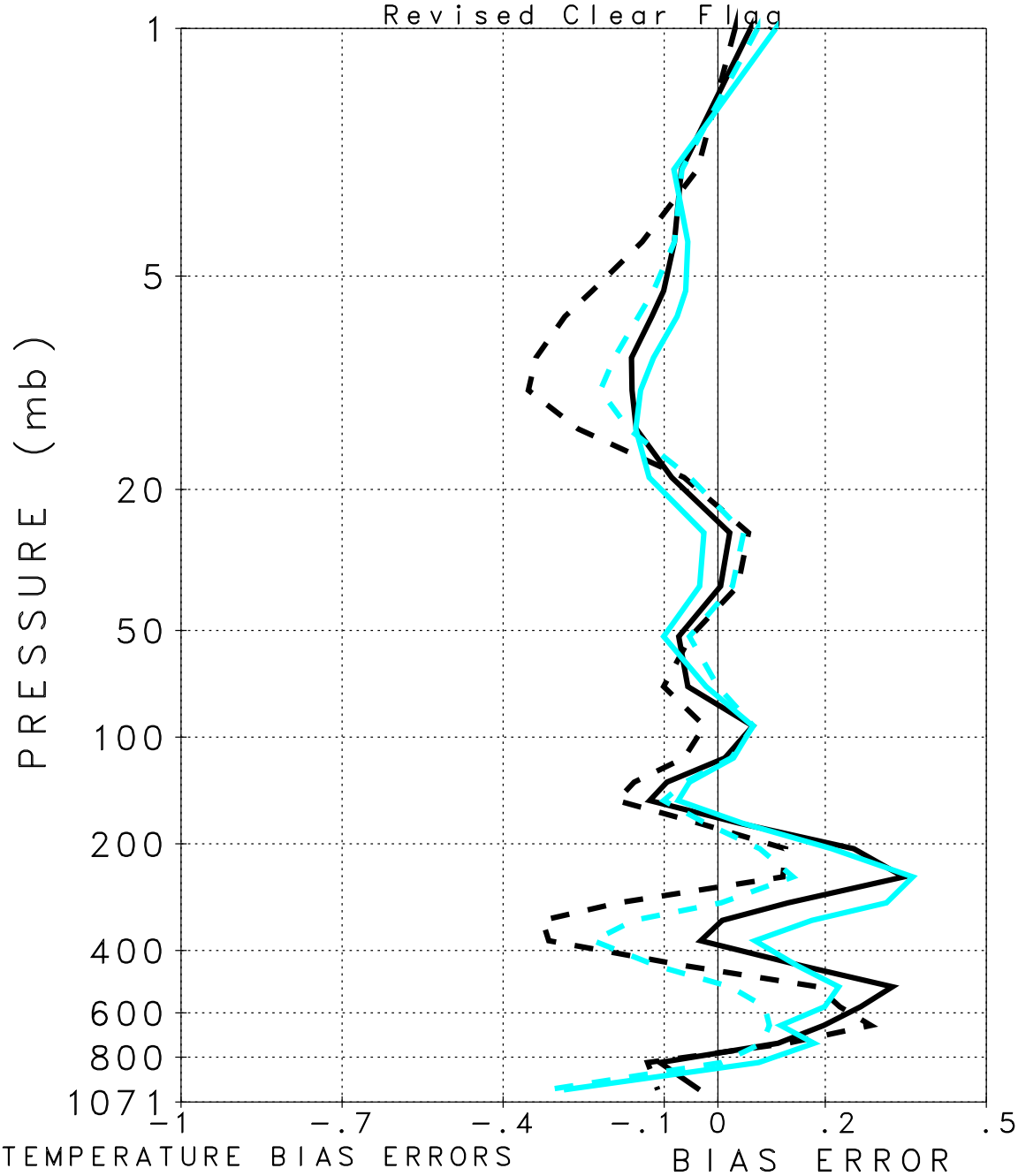
SKIN TEMP	STATISTICS trop	700-surf	
0.77	0.85	1.09	First Product CASE 7
0.38	0.66	0.78	Final Product CASE 7
0.92	0.81	1.18	First Product CASE 8
0.50	0.63	0.85	Final Product CASE 8

February Simulation of December 15, 2000

CASE 7 and 8

LAYER MEAN BIAS TEMPERATURE ERRORS (°C)

Revised Clear Flag



TEMPERATURE BIAS ERRORS

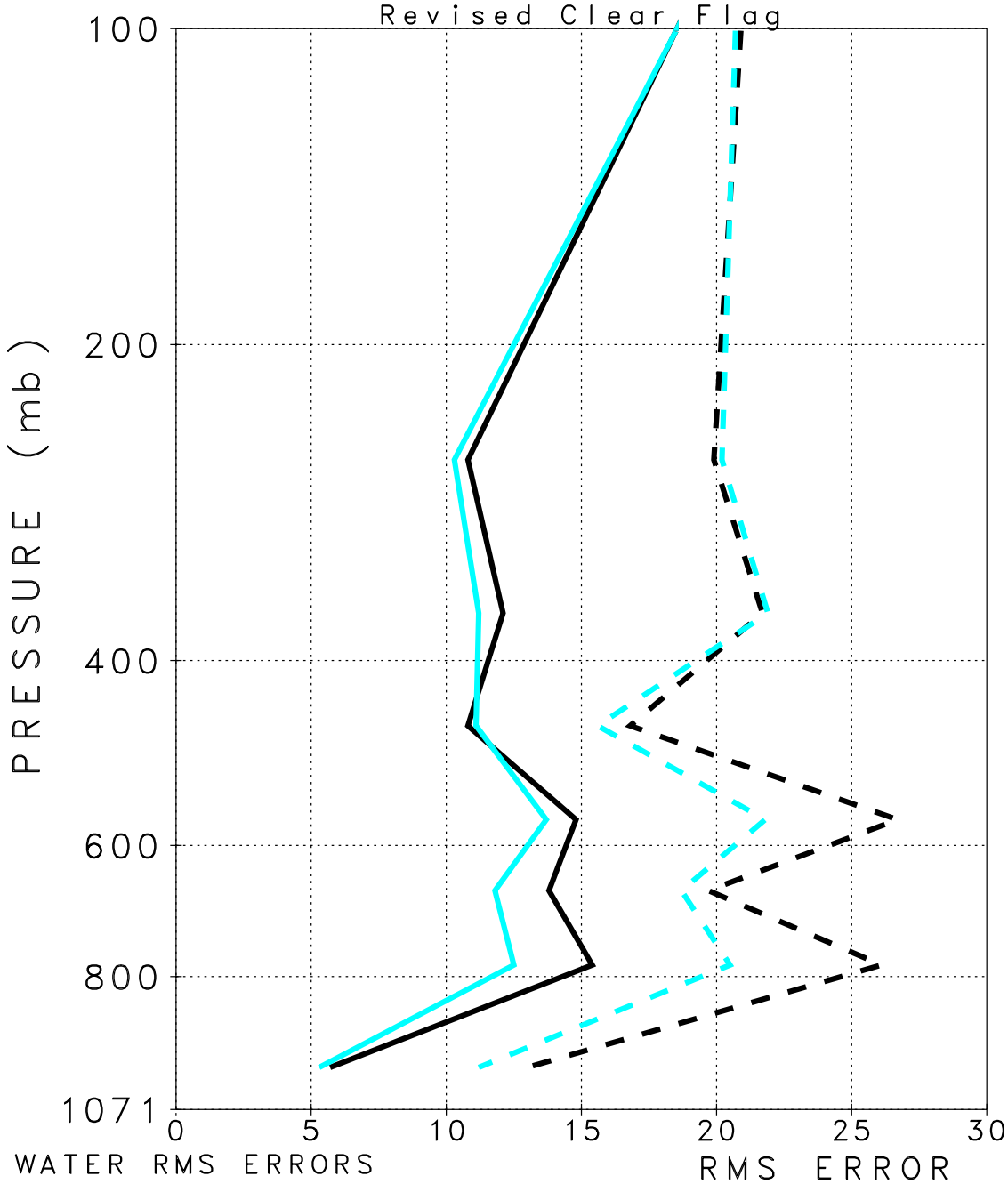
SKIN TEMP	STATISTICS trop	700-surf	
-0.05	-0.03	-0.04	First Product CASE 7
-0.05	0.09	-0.01	Final Product CASE 7
-0.42	-0.03	-0.08	First Product CASE 8
-0.23	0.11	-0.01	Final Product CASE 8

February Simulation of December 15, 2000

CASE 7 and 8

2 Km LAYER PRECIPITABLE WATER PERCENT ERRORS

Revised Clear Flag



WATER RMS ERRORS

Total %	2 Km LAYER %	
17.4	20.6	First Product Case 7
9.2	12.7	Final Product Case 7
14.9	18.8	First Product Case 8
8.3	11.8	Final Product Case 8