

5.2.2.2 WAC FM PRF CALIBRATION RESULTS

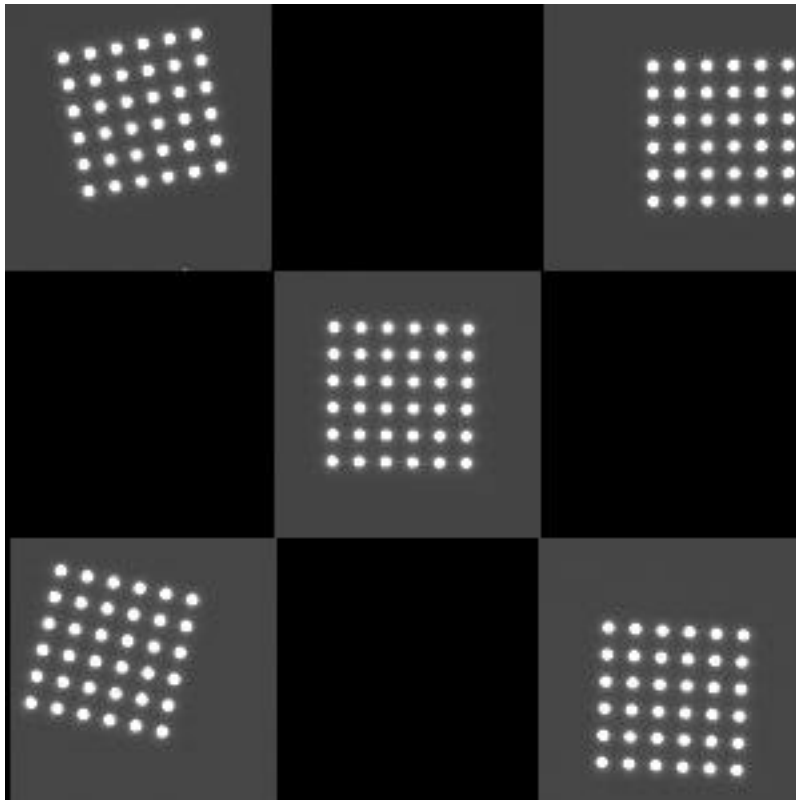
As reported in Reference 5.2.2.2-1

Reference 5.2.2.2-1 - IOM 388-PAG-CCA98-6, "WAC FM CALIBRATION RESULTS: Point Response Function", C. Avis, March 11, 1998

5.2.2.2.1 INTRODUCTION

The Flight Model thermal/vacuum testing included the acquisition of images taken of simulated point sources. This memo reports on the use of those images to characterize the Point Response Function (PRF) in the various filter combinations tested.

The PRF sequences consisted of exposures of a 6x6 grid of pinholes which was optically placed into the four corners and center of the image area. The holes were about 10.05 pixels apart arranged in more-or-less horizontal rows. The following image is NOT an image of the target. This is a composite image made from cutouts from the four corners and the center showing the appearance of each of the grids. It allows a full-resolution view of the data without all the empty space between the grids.



The exposures were made with a flash illuminant to minimize the effects of vibration. The target was generally moved minutely between exposures to make the point images fall on different parts of the CCD pixels. All images were taken in 1x1 mode at Gain 2 with

Lightflood ON and Antiblooming OFF. The detector was at -90°C and the chamber was at -5°C , $+10^{\circ}\text{C}$ or $+25^{\circ}\text{C}$. The following filter combinations were tested: CL1/CL2, CL1/BL1 and CB3/CL2.

5.2.2.2.2 METHOD

Each image was searched for all star-like objects after having dark-current removed. The dark-current frame used was actually another flash exposure which was miss-timed such that it missed the flash of the illuminant. In most frames, all 180 points were located and were suitable for analysis.

A value for the background of each point was derived using the values of the pixels immediately exterior to a box around the point.

$$BK = \frac{1}{n} \sum_{i,j} S_{i,j}$$

- where BK is the background value for each point
- $S_{i,j}$ is the signal above dark-current for each pixel
- i,j are the indices defining a one pixel wide border exterior to a 9x9 box around each point.
- n is the number of pixels in the border

The normalized response NDN of each pixel near a centroid was generated by dividing by the total of the response values in the 9x9 pixel area centered on the centroid.

$$NDN_{i,j} = \frac{S_{i,j} - BK}{\sum_{\substack{i=1,9 \\ j=1,9}} (S_{i,j} - BK)}$$

A catalog was created which recorded the centroid location of each point and the normalized response values of the surrounding 9x9 pixel area. The catalog was used to create sets of data for analysis. It was possible to select for analysis:

- data from certain regions of the image (e.g., the upper left corner)
- data whose centroids fell at certain parts of the pixels (e.g., centroids which fell between two pixels)

For every selected set of data, the normalized responses were combined into a mean normalized point response image. This process began with the construction of a 50x50 array of bins. The exact centroid of each point was defined to fall into bin (25,25). For each point in the selected set of data, the following steps were followed:

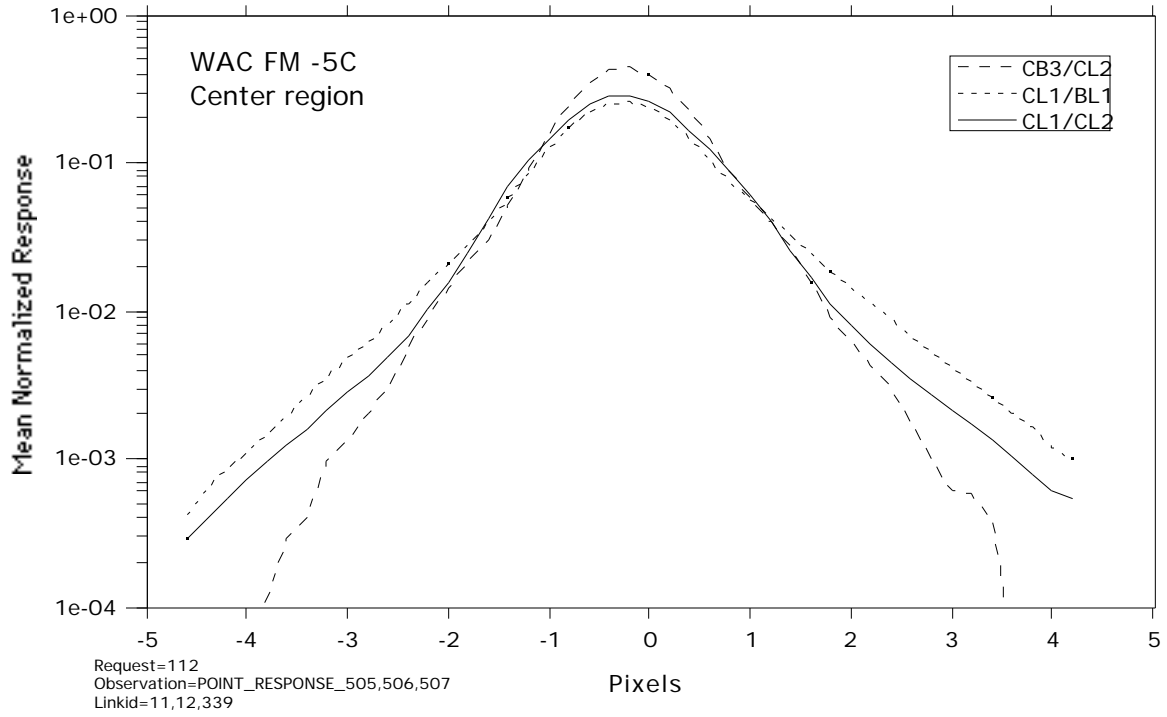
- for each pixel in the 9x9 area around each point
 1. calculate the delta i and delta j from the point's centroid
 2. scale these deltas by 5
 3. place this pixel's NDN in the bin with the appropriate delta i and delta j from the center of the 50x50 array

After all points from all images in the selected set of data were processed, the values in the 50x50 array were divided by the number of values put into each bin to produce a mean normalized point response image. By scaling the deltas by 5 before placement into discrete bins, the resolution of the final point response image is 0.2 pixels.

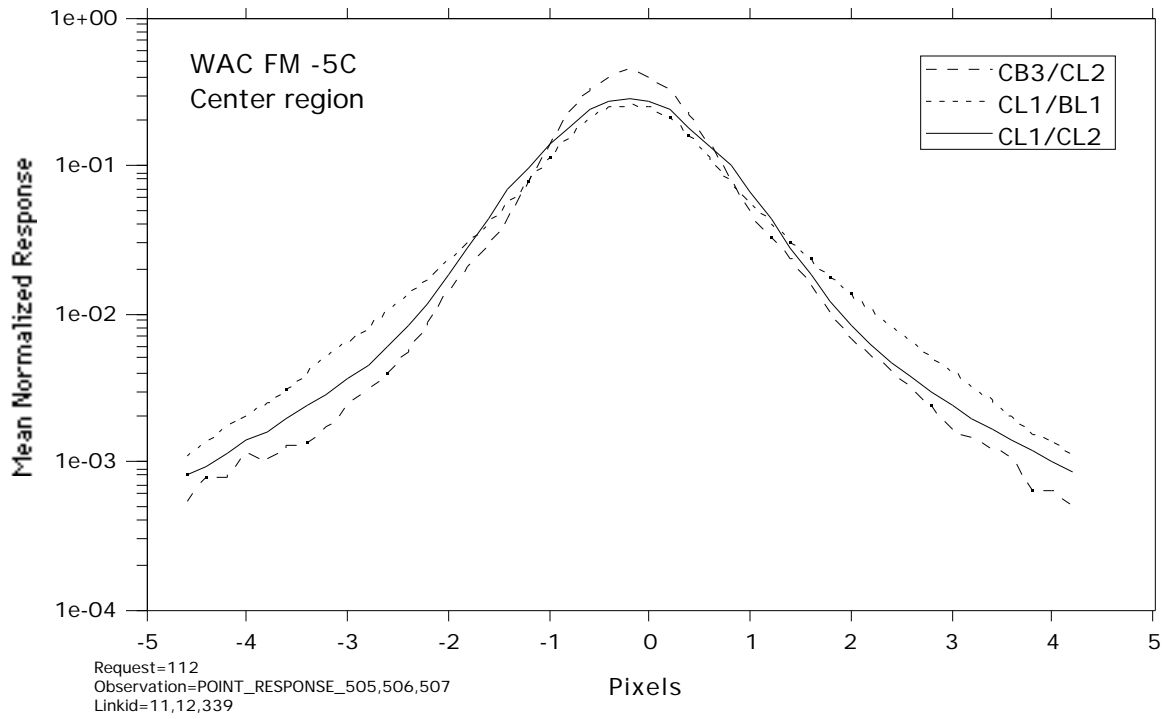
5.2.2.2.3 CENTER REGION PROFILES

The following plots show the profiles of PRFs derived from the center region of the images. All three temperatures sets are shown in both horizontal and vertical profiles.

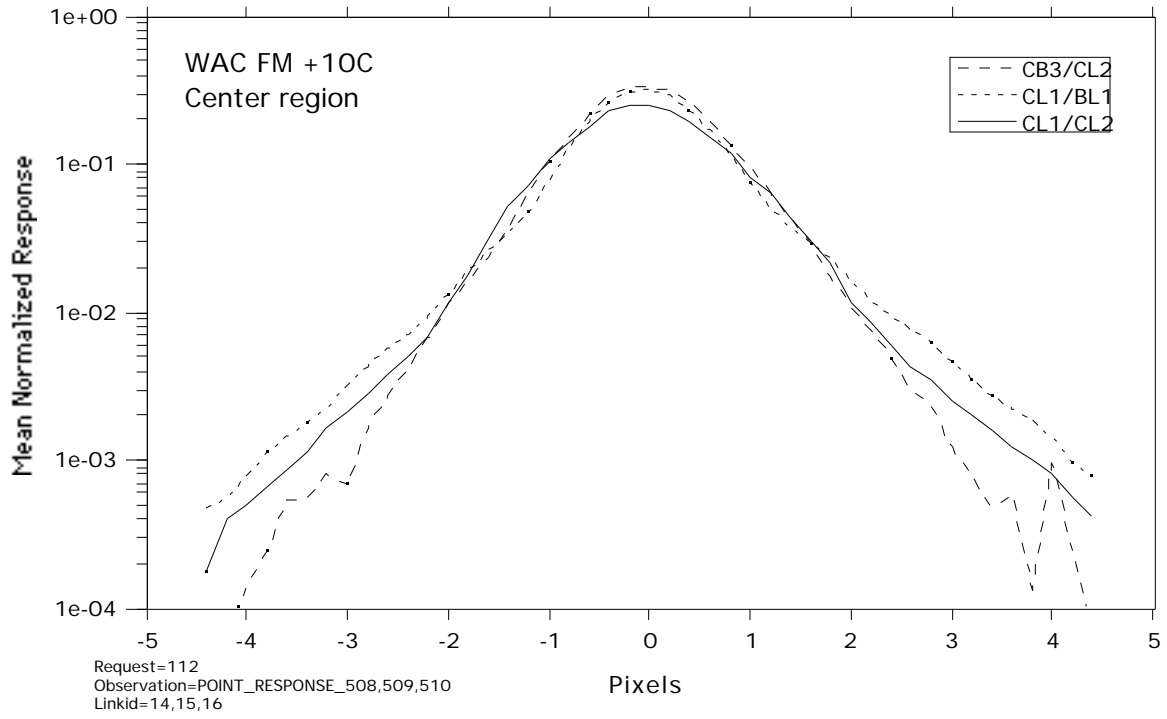
Vertical Profile through Center



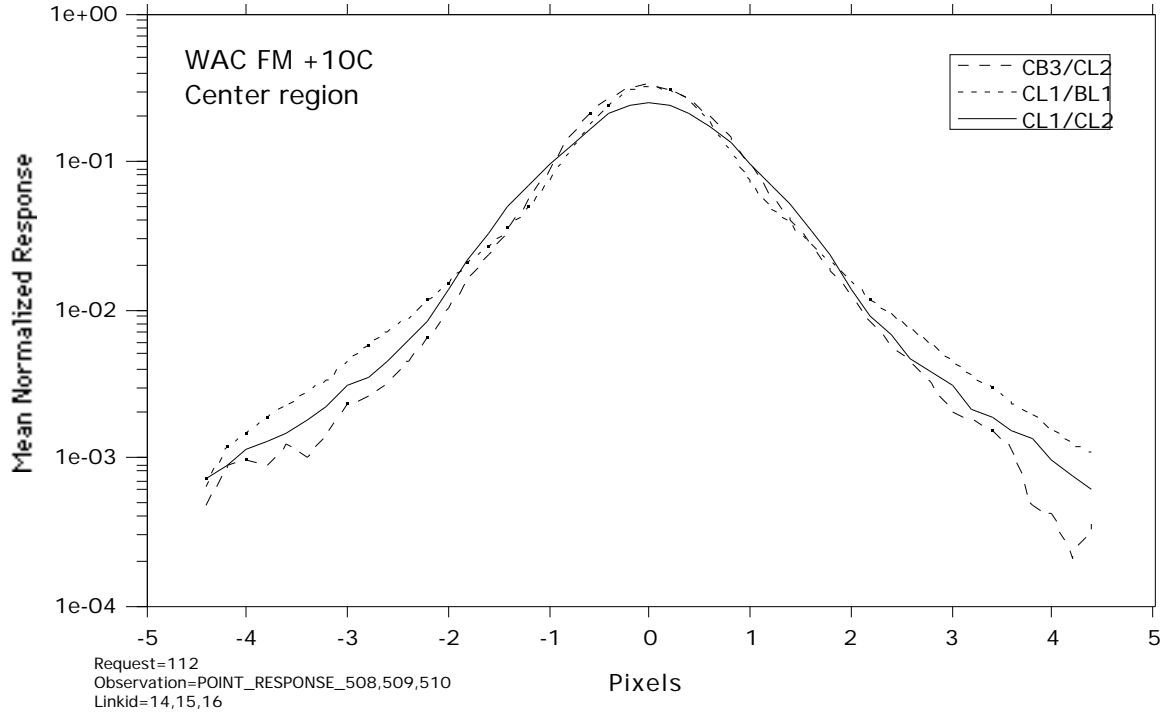
Horizontal Profile through Center



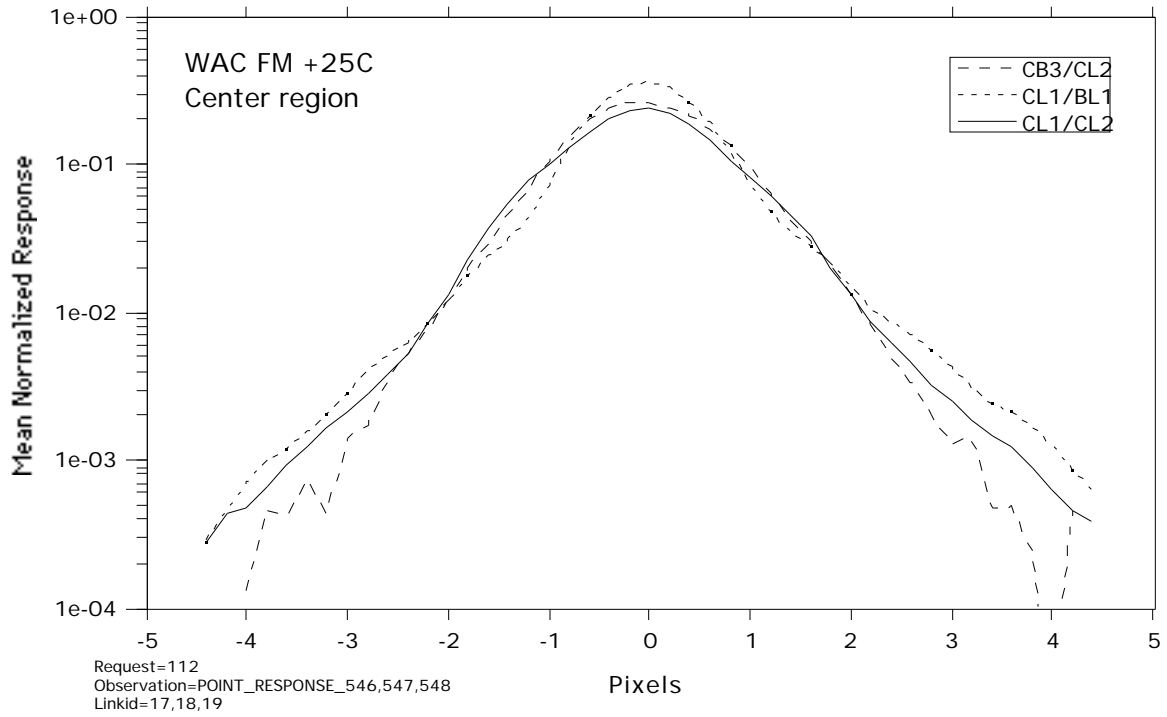
Vertical Profile through Center



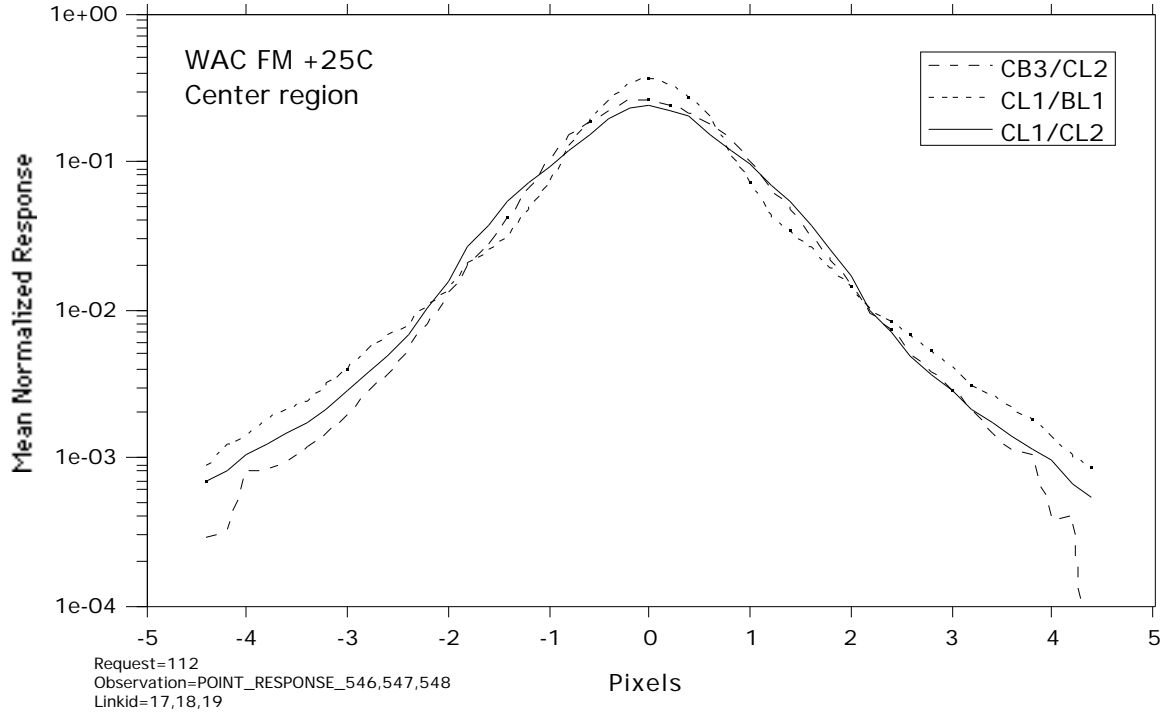
Horizontal Profile through Center



Vertical Profile through Center



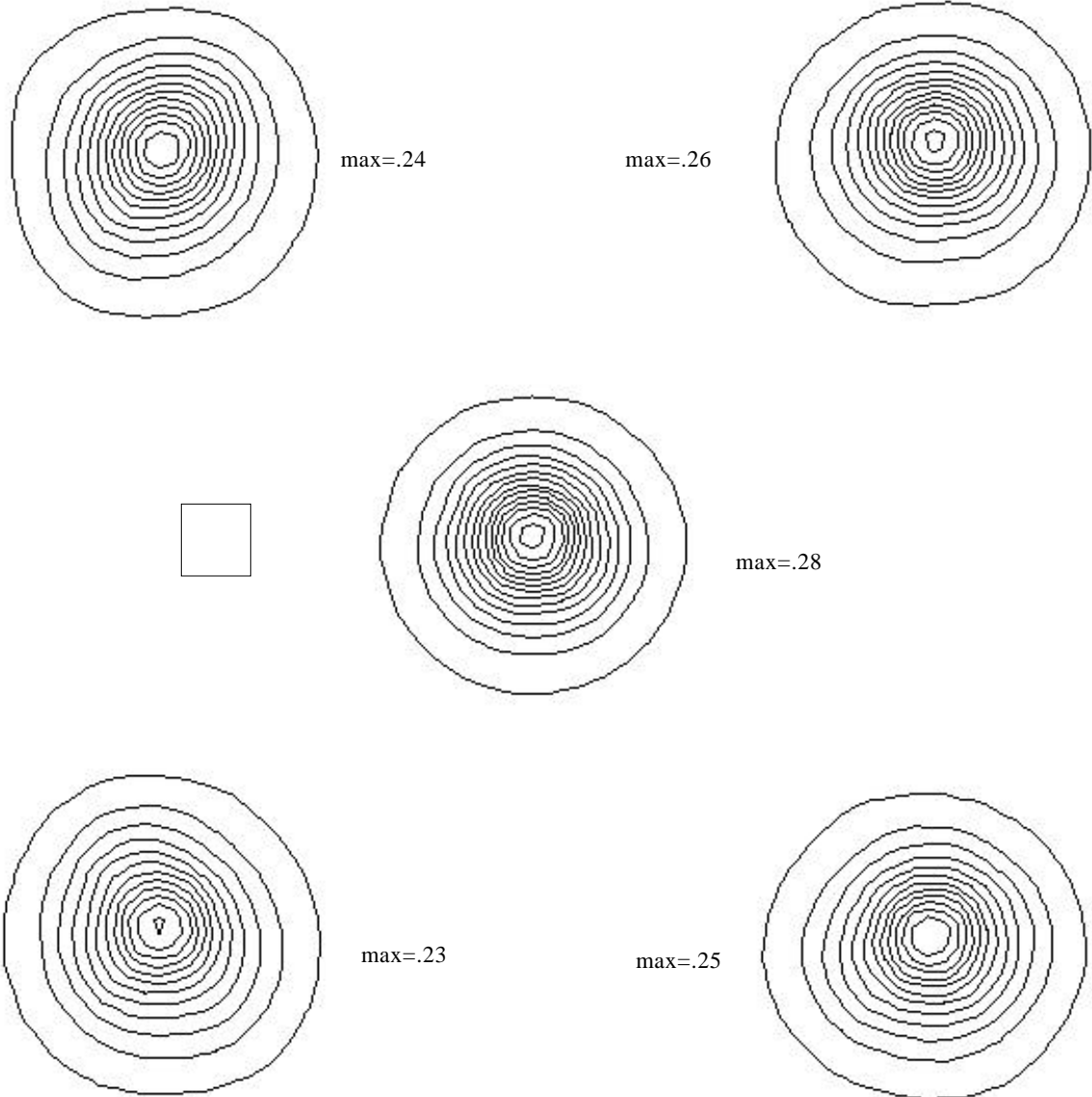
Horizontal Profile through Center



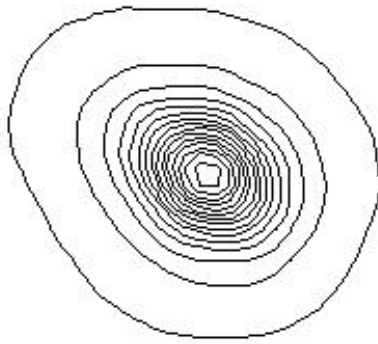
5.2.2.2.4 POSITION DEPENDENCE

The following plots contour the PRFs derived from each corner and the center for all three temperatures. All use the same scale and contour spacing (starting at .01 and increasing in .02 steps). A one-pixel square box illustrates the scale.

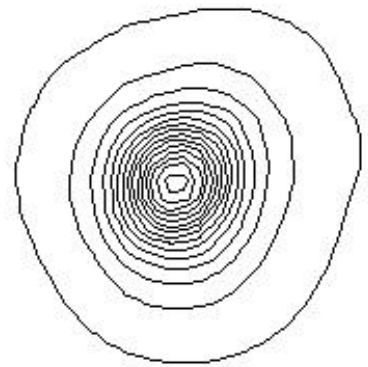
CL1/CL2 -5° C



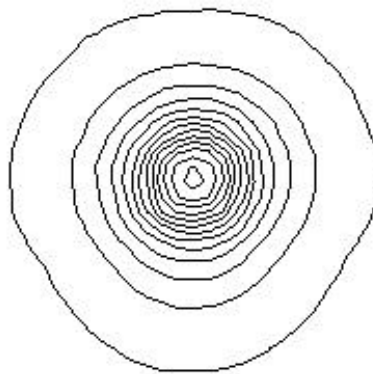
CL1/BL1 -5° C



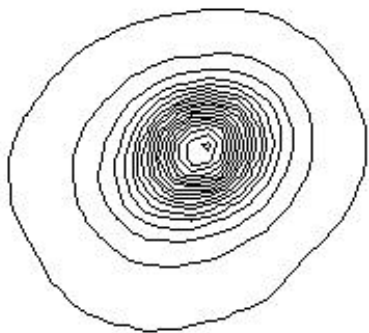
max=.30



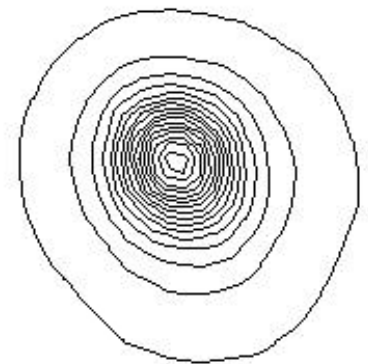
max=.30



max=.26

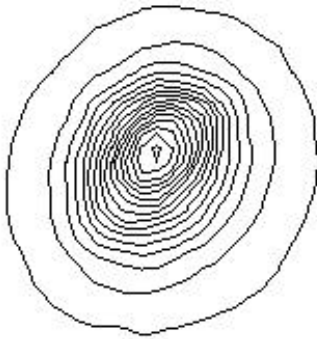


max=.36

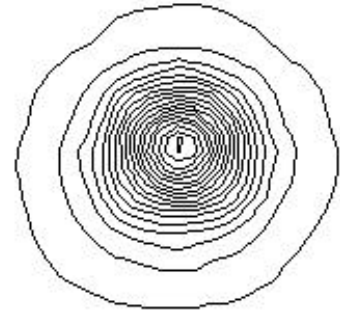


max=.32

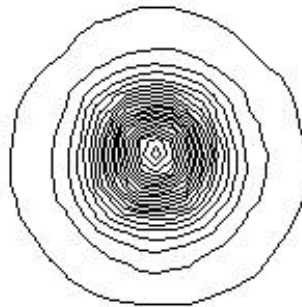
CB3/CL2 -5° C



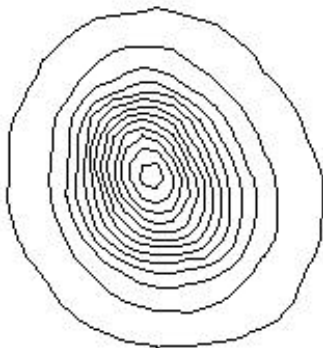
max=.32



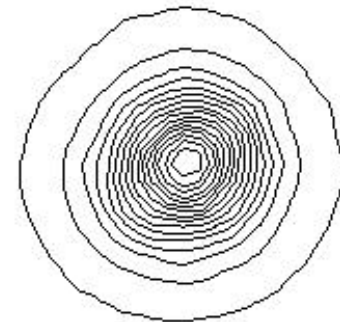
max=.35



max=.44

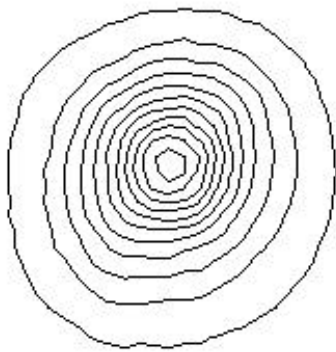


max=.26

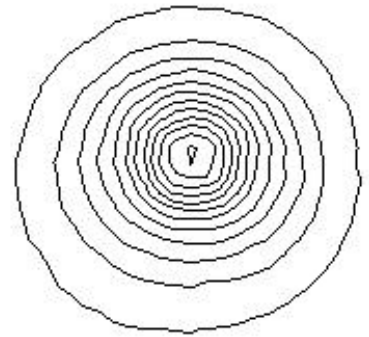


max=.33

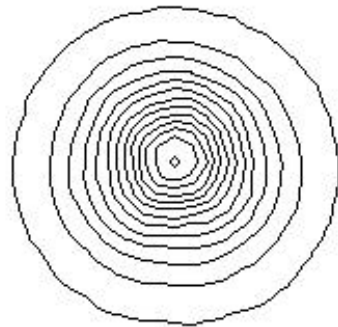
CL1/CL2 +10° C



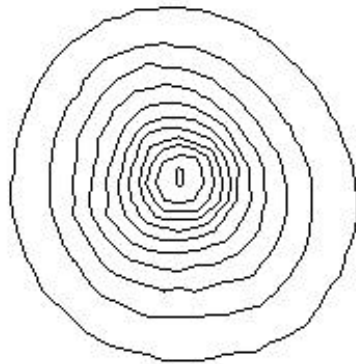
max=.22



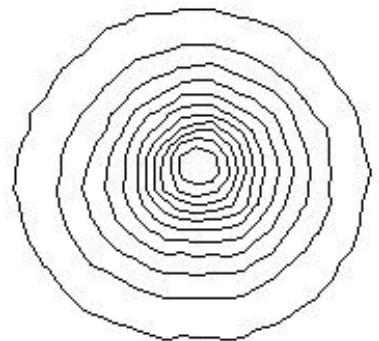
max=.23



max=.25



max=.21

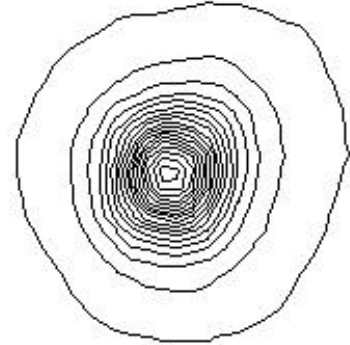


max=.23

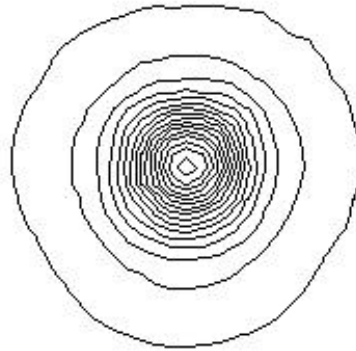
CL1/BL1 +10° C



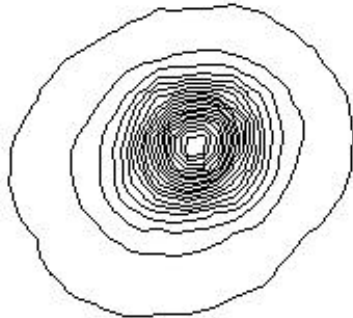
max=.36



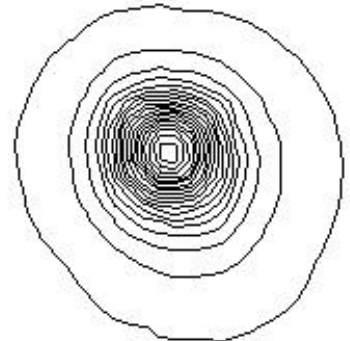
max=.36



max=.32



max=.40

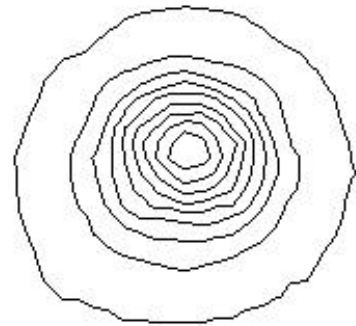


max=.38

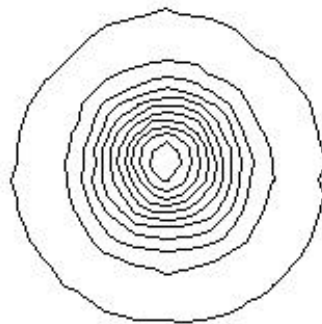
CB3/CL2 +10° C



max=.24



max=.27



max=.33

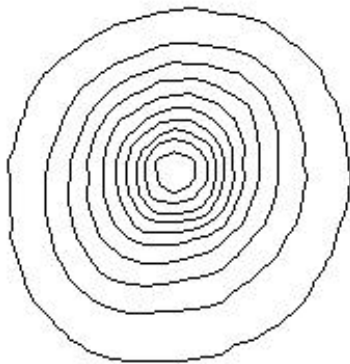


max=.18

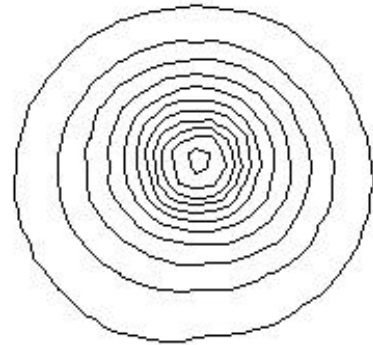


max=.24

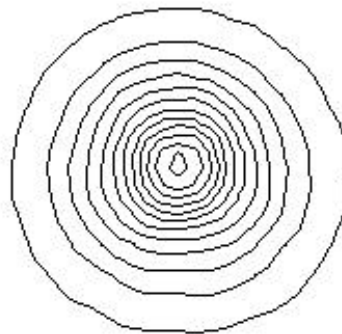
CL1/CL2 +25



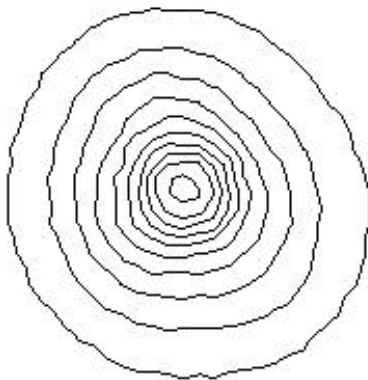
max=.20



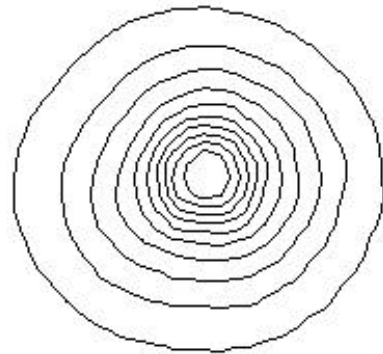
max=.22



max=.24

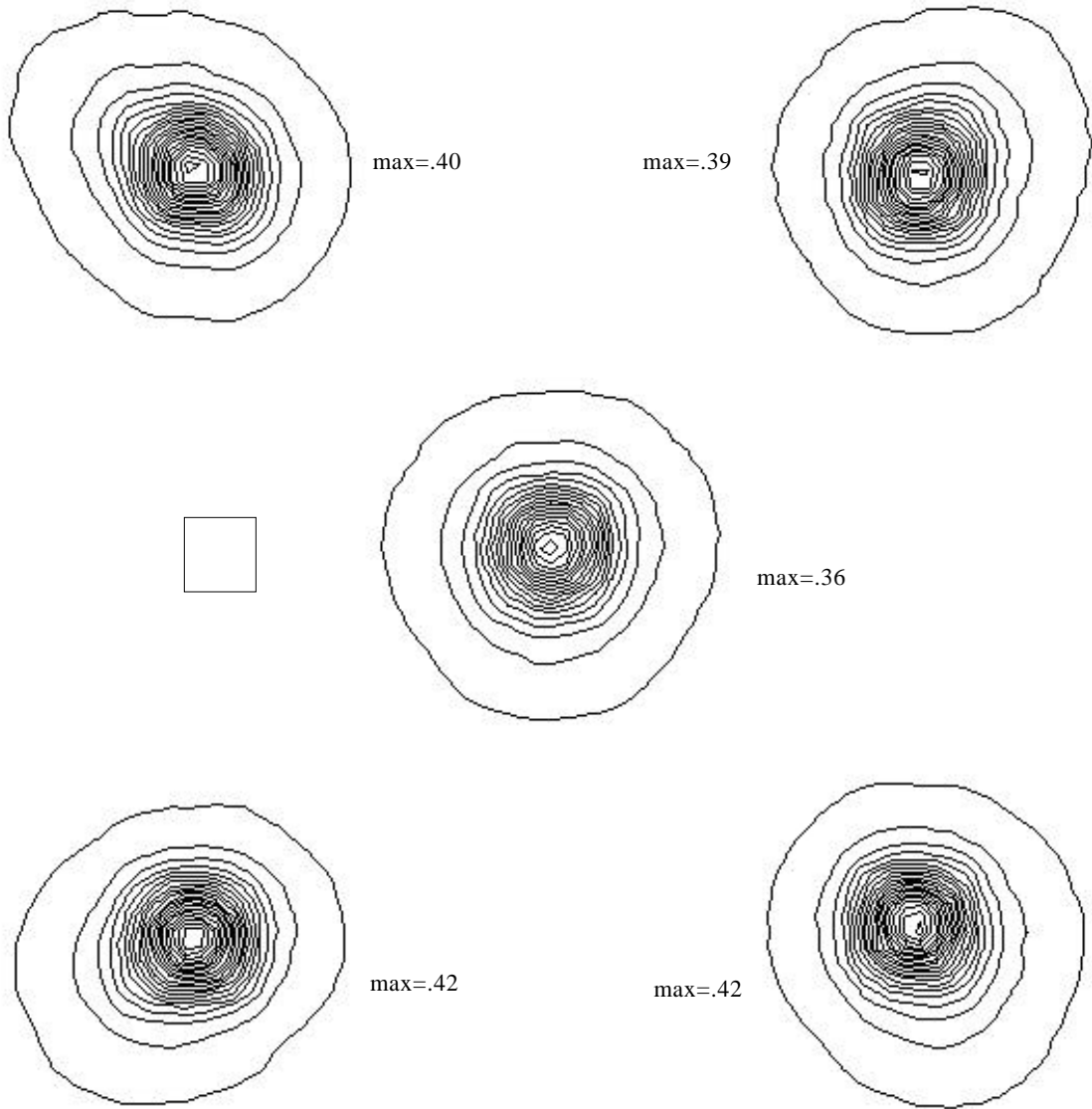


max=.20



max=.21

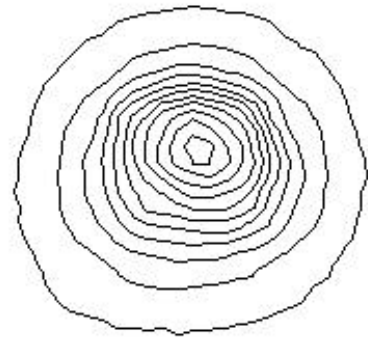
CL1/BL1 +25



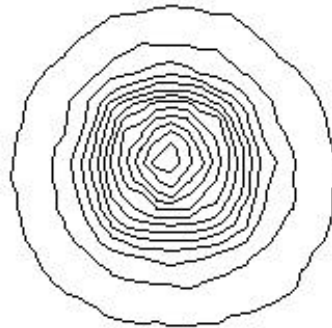
CB3/CL2 +25



max=.20



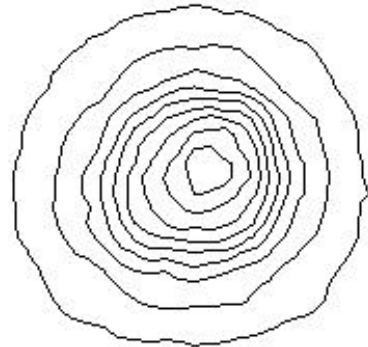
max=.22



max=.26



max=.14



max=.18

5.2.2.2.5 PEAK VALUES

The tables below compare the peak response in the 5 regions for all filter combinations tested at all three test temperatures. This analysis gave a typical standard deviation of about 0.007. Note that the inconsistent variation is expected due to the compromises made in the focus quality of each filter.

Peak Values - Center

Filter	-5° C	+10° C	+25° C
CL1/CL2	.28	.25	.24
CL1/BL1	.26	.32	.36
CB3/CL2	.44	.33	.26

Peak Values - Upper left

Filter	-5° C	+10° C	+25° C
CL1/CL2	.24	.22	.20
CL1/BL1	.30	.36	.40
CB3/CL2	.32	.24	.20

Peak Values - Upper right

Filter	-5° C	+10° C	+25° C
CL1/CL2	.26	.23	.22
CL1/BL1	.30	.36	.39
CB3/CL2	.35	.27	.22

Peak Values - Lower left

Filter	-5° C	+10° C	+25° C
CL1/CL2	.23	.21	.20
CL1/BL1	.36	.40	.42
CB3/CL2	.26	.18	.14

Peak Values - Lower right

Filter	-5° C	+10° C	+25° C
CL1/CL2	.25	.23	.21
CL1/BL1	.32	.38	.42
CB3/CL2	.33	.24	.18

5.2.2.2.6 CONCLUSIONS

1. The center region of CL1/BL1 had a lower peak PRF than the corners. Also, the corner regions showed significant radial elongation of the PRF.
2. The center region of CB3/CL2 had a much higher peak than the corners. The lower left region was significantly very low. Also, the corners showed significant azimuthal elongation of the PRF.
3. The center region of CL1/CL2 had a slightly higher response than the corners.
4. All filters changed response with increasing temperature. CL1/CL2 and CB3/CL2 decreased, while CL1/BL1 increased.
5. CB3/CL2 showed large corner-to-center variation which got much lower with higher temperature.

5.2.2.2.7 List of Frames Used in PRF Analysis

Image	day	eventtime	observation	filters	temp	Image	day	eventtime	observation	filters	temp
127536	185	17:52:3.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127622	185	22:46:12.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127537	185	17:55:59.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127623	185	22:48:3.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127538	185	17:58:54.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127624	185	22:49:39.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127539	185	18:2:16.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127625	185	22:51:18.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127540	185	18:5:23.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127627	185	22:55:13.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127541	185	18:18:32.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127628	185	22:57:7.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127543	185	18:23:8.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127629	185	22:59:1.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127544	185	18:26:1.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127630	185	23:0:47.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127545	185	18:28:30.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127631	185	23:2:21.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127546	185	18:30:38.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127632	185	23:3:59.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127548	185	19:17:48.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127633	185	23:5:48.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127550	185	19:22:20.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127634	185	23:7:23.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127551	185	19:24:9.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127635	185	23:9:5.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127552	185	19:26:7.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127636	185	23:10:42.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127553	185	19:27:57.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127637	185	23:12:26.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127554	185	19:30:33.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127638	185	23:14:3.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127555	185	19:32:43.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127639	185	23:15:57.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127556	185	19:34:33.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127640	185	23:17:37.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127559	185	19:42:10.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127641	185	23:22:15.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127560	185	19:45:13.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127643	185	23:26:42.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127561	185	19:47:37.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127644	185	23:29:45.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127562	185	19:49:38.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127645	185	23:31:19.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127563	185	19:52:15.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127646	186	0:19:34.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127564	185	19:54:8.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127647	186	0:25:33.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127565	185	19:56:49.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127648	186	0:27:20.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127566	185	19:58:54.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127649	186	0:29:31.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127568	185	20:2:29.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127650	186	0:31:15.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127569	185	20:4:28.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127651	186	0:33:2.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127570	185	20:6:29.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127652	186	0:35:32.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127571	185	20:10:1.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127653	186	0:38:27.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127572	185	20:12:26.0	POINT_RESPONSE_505	CL1 /CL2	-5.0	127654	186	0:40:23.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127580	185	20:52:28.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	127655	186	0:42:6.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127581	185	20:54:59.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	127656	186	0:43:40.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127582	185	20:57:2.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	127657	186	0:45:16.0	POINT_RESPONSE_507	CB3 /CL2	-5.0
127583	185	20:59:50.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128021	187	1:28:12.0	POINT_RESPONSE_502	MT3 /CL2	-5.0
127584	185	21:1:45.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128023	187	1:31:44.0	POINT_RESPONSE_502	MT3 /CL2	-5.0
127585	185	21:3:48.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128024	187	1:33:48.0	POINT_RESPONSE_502	MT3 /CL2	-5.0
127586	185	21:5:45.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128025	187	1:36:10.0	POINT_RESPONSE_502	MT3 /CL2	-5.0
127587	185	21:7:39.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128026	187	1:40:15.0	POINT_RESPONSE_502	MT3 /CL2	-5.0
127588	185	21:9:40.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128027	187	1:49:40.0	POINT_RESPONSE_502	MT3 /CL2	-5.0
127589	185	21:11:43.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128028	187	2:7:37.0	POINT_RESPONSE_502	MT3 /CL2	-5.0
127590	185	21:13:32.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128029	187	2:25:34.0	POINT_RESPONSE_502	MT3 /CL2	-5.0
127591	185	21:16:1.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128030	187	2:43:31.0	POINT_RESPONSE_502	MT3 /CL2	-5.0
127592	185	21:18:16.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128031	187	3:1:28.0	POINT_RESPONSE_502	MT3 /CL2	-5.0
127593	185	21:20:13.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128032	187	3:8:15.0	POINT_RESPONSE_502	MT3 /CL2	-5.0
127594	185	21:22:5.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128033	187	3:9:25.0	POINT_RESPONSE_502	MT3 /CL2	-5.0
127595	185	21:23:52.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128037	187	3:45:32.0	POINT_RESPONSE_504	MT3 /IRP0	-5.0
127596	185	21:25:41.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128038	187	3:46:42.0	POINT_RESPONSE_504	MT3 /IRP0	-5.0
127597	185	21:27:34.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128039	187	3:48:7.0	POINT_RESPONSE_504	MT3 /IRP0	-5.0
127598	185	21:29:49.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128040	187	3:49:41.0	POINT_RESPONSE_504	MT3 /IRP0	-5.0
127599	185	21:31:48.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128041	187	3:52:10.0	POINT_RESPONSE_504	MT3 /IRP0	-5.0
127600	185	21:33:51.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128042	187	3:56:17.0	POINT_RESPONSE_504	MT3 /IRP0	-5.0
127601	185	21:38:49.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128044	187	4:15:18.0	POINT_RESPONSE_504	MT3 /IRP0	-5.0
127602	185	21:43:3.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128045	187	4:33:17.0	POINT_RESPONSE_504	MT3 /IRP0	-5.0
127603	185	21:45:18.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128046	187	4:51:14.0	POINT_RESPONSE_504	MT3 /IRP0	-5.0
127604	185	21:47:30.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128047	187	5:12:19.0	POINT_RESPONSE_504	MT3 /IRP0	-5.0
127605	185	21:49:32.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128048	187	5:17:30.0	POINT_RESPONSE_504	MT3 /IRP0	-5.0
127606	185	21:51:25.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128049	187	5:38:35.0	POINT_RESPONSE_504	MT3 /IRP0	-5.0
127607	185	21:53:15.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128050	187	5:59:40.0	POINT_RESPONSE_504	MT3 /IRP0	-5.0
127608	185	21:55:5.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128051	187	6:20:47.0	POINT_RESPONSE_504	MT3 /IRP0	-5.0
127609	185	21:56:57.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128052	187	6:34:4.0	POINT_RESPONSE_504	MT3 /IRP0	-5.0
127610	185	21:58:57.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128057	187	7:15:38.0	POINT_RESPONSE_501	CL1 /CL2	-5.0
127611	185	22:1:19.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128058	187	7:17:7.0	POINT_RESPONSE_501	CL1 /CL2	-5.0
127612	185	22:3:11.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128059	187	7:18:36.0	POINT_RESPONSE_501	CL1 /CL2	-5.0
127613	185	22:10:45.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128060	187	7:20:6.0	POINT_RESPONSE_501	CL1 /CL2	-5.0
127614	185	22:12:37.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128061	187	7:21:35.0	POINT_RESPONSE_501	CL1 /CL2	-5.0
127615	185	22:14:26.0	POINT_RESPONSE_506	CL1 /BL1	-5.0	128062	187	7:23:4.0	POINT_RESPONSE_501	CL1 /CL2	-5.0
127620	185	22:41:59.0	POINT_RESPONSE_507	CB3 /CL2	-5.0	128063	187	7:24:20.0	POINT_RESPONSE_501	CL1 /CL2	-5.0
127621	185	22:44:8.0	POINT_RESPONSE_507	CB3 /CL2	-5.0	128064	187	7:26:0.0	POINT_RESPONSE_501	CL1 /CL2	-5.0

Image	day	eventtime	observation	filters	temp	Image	day	eventtime	observation	filters	temp
128065	187	7:27:17.0	POINT_RESPONSE_501	CLL /CL2	-5.0	128243	188	13:12:15.0	POINT_RESPONSE_523	IR4 /CL2	8.0
128067	187	7:30:41.0	POINT_RESPONSE_501	CLL /CL2	-5.0	128244	188	13:33:22.0	POINT_RESPONSE_523	IR4 /CL2	8.0
128078	187	8:13:49.0	POINT_RESPONSE_500	CLL /BL1	-5.0	128246	188	16:29:26.0	POINT_RESPONSE_523	IR4 /CL2	8.0
128080	187	8:16:28.0	POINT_RESPONSE_500	CLL /BL1	-5.0	128403	189	4:3:12.0	POINT_RESPONSE_508	CLL /CL2	8.0
128081	187	8:18:9.0	POINT_RESPONSE_500	CLL /BL1	-5.0	128404	189	4:13:23.0	POINT_RESPONSE_508	CLL /CL2	8.0
128082	187	8:19:33.0	POINT_RESPONSE_500	CLL /BL1	-5.0	128405	189	4:16:49.0	POINT_RESPONSE_508	CLL /CL2	8.0
128083	187	8:21:7.0	POINT_RESPONSE_500	CLL /BL1	-5.0	128406	189	4:20:7.0	POINT_RESPONSE_508	CLL /CL2	8.0
128084	187	8:23:36.0	POINT_RESPONSE_500	CLL /BL1	-5.0	128407	189	4:23:27.0	POINT_RESPONSE_508	CLL /CL2	8.0
128085	187	8:27:34.0	POINT_RESPONSE_500	CLL /BL1	-5.0	128408	189	4:29:9.0	POINT_RESPONSE_508	CLL /CL2	8.0
128087	187	8:42:1.0	POINT_RESPONSE_500	CLL /BL1	-5.0	128411	189	4:35:44.0	POINT_RESPONSE_508	CLL /CL2	8.0
128088	187	8:59:58.0	POINT_RESPONSE_500	CLL /BL1	-5.0	128412	189	4:39:17.0	POINT_RESPONSE_508	CLL /CL2	8.0
128094	187	9:55:41.0	POINT_RESPONSE_500	CLL /BL1	-5.0	128413	189	4:42:20.0	POINT_RESPONSE_508	CLL /CL2	8.0
128095	187	10:1:19.0	POINT_RESPONSE_500	CLL /BL1	-5.0	128414	189	5:26:2.0	POINT_RESPONSE_509	CLL /BL1	8.0
128096	187	10:26:22.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128415	189	5:32:5.0	POINT_RESPONSE_509	CLL /BL1	8.0
128097	187	10:27:40.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128416	189	5:35:16.0	POINT_RESPONSE_509	CLL /BL1	8.0
128098	187	10:29:21.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128417	189	5:38:2.0	POINT_RESPONSE_509	CLL /BL1	8.0
128099	187	10:31:50.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128418	189	5:40:49.0	POINT_RESPONSE_509	CLL /BL1	8.0
128101	187	10:41:33.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128419	189	5:44:1.0	POINT_RESPONSE_509	CLL /BL1	8.0
128102	187	10:42:51.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128420	189	5:46:52.0	POINT_RESPONSE_509	CLL /BL1	8.0
128104	187	10:47:12.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128422	189	5:51:30.0	POINT_RESPONSE_509	CLL /BL1	8.0
128105	187	10:50:15.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128423	189	5:54:16.0	POINT_RESPONSE_509	CLL /BL1	8.0
128107	187	11:5:0.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128424	189	6:13:9.0	POINT_RESPONSE_510	CB3 /CL2	8.0
128108	187	11:14:27.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128427	189	6:21:7.0	POINT_RESPONSE_510	CB3 /CL2	8.0
128109	187	11:32:24.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128428	189	6:24:31.0	POINT_RESPONSE_510	CB3 /CL2	8.0
128110	187	11:50:21.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128429	189	6:27:12.0	POINT_RESPONSE_510	CB3 /CL2	8.0
128112	187	12:32:46.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128430	189	6:29:48.0	POINT_RESPONSE_510	CB3 /CL2	8.0
128113	187	12:53:53.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128431	189	6:33:13.0	POINT_RESPONSE_510	CB3 /CL2	8.0
128114	187	13:15:0.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128432	189	6:36:3.0	POINT_RESPONSE_510	CB3 /CL2	8.0
128115	187	13:36:7.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128433	189	6:38:38.0	POINT_RESPONSE_510	CB3 /CL2	8.0
128116	187	13:57:15.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128434	189	6:41:20.0	POINT_RESPONSE_510	CB3 /CL2	8.0
128118	187	14:39:40.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128623	190	0:43:51.0	POINT_RESPONSE_541	CLL /CL2	25.0
128119	187	15:0:47.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128624	190	0:45:20.0	POINT_RESPONSE_541	CLL /CL2	26.0
128120	187	15:21:54.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128626	190	0:48:19.0	POINT_RESPONSE_541	CLL /CL2	26.0
128122	187	15:36:30.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128627	190	0:49:48.0	POINT_RESPONSE_541	CLL /CL2	26.0
128123	187	15:57:35.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128628	190	0:51:17.0	POINT_RESPONSE_541	CLL /CL2	26.0
128124	187	16:18:42.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128629	190	0:52:33.0	POINT_RESPONSE_541	CLL /CL2	26.0
128125	187	16:26:54.0	POINT_RESPONSE_503	IR4 /CL2	-5.0	128630	190	0:54:13.0	POINT_RESPONSE_541	CLL /CL2	26.0
128131	188	0:43:6.0	POINT_RESPONSE_520	CLL /BL1	8.0	128631	190	0:55:30.0	POINT_RESPONSE_541	CLL /CL2	26.0
128132	188	0:44:35.0	POINT_RESPONSE_520	CLL /BL1	8.0	128632	190	0:57:4.0	POINT_RESPONSE_541	CLL /CL2	26.0
128133	188	0:45:45.0	POINT_RESPONSE_520	CLL /BL1	8.0	128633	190	0:58:54.0	POINT_RESPONSE_541	CLL /CL2	26.0
128134	188	0:47:25.0	POINT_RESPONSE_520	CLL /BL1	8.0	128634	190	1:10:29.0	POINT_RESPONSE_541	CLL /CL2	26.0
128135	188	0:48:50.0	POINT_RESPONSE_520	CLL /BL1	8.0	128635	190	1:13:10.0	POINT_RESPONSE_541	CLL /CL2	26.0
128136	188	0:50:24.0	POINT_RESPONSE_520	CLL /BL1	8.0	128636	190	1:15:53.0	POINT_RESPONSE_541	CLL /CL2	26.0
128137	188	0:52:53.0	POINT_RESPONSE_520	CLL /BL1	8.0	128640	190	1:35:3.0	POINT_RESPONSE_542	MT3 /CL2	26.0
128138	188	0:56:51.0	POINT_RESPONSE_520	CLL /BL1	8.0	128642	190	1:37:53.0	POINT_RESPONSE_542	MT3 /CL2	26.0
128139	188	1:1:53.0	POINT_RESPONSE_520	CLL /BL1	8.0	128643	190	1:39:34.0	POINT_RESPONSE_542	MT3 /CL2	26.0
128141	188	1:29:25.0	POINT_RESPONSE_520	CLL /BL1	8.0	128644	190	1:41:38.0	POINT_RESPONSE_542	MT3 /CL2	26.0
128142	188	1:41:23.0	POINT_RESPONSE_520	CLL /BL1	8.0	128645	190	1:44:1.0	POINT_RESPONSE_542	MT3 /CL2	26.0
128144	188	2:0:26.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128646	190	1:48:5.0	POINT_RESPONSE_542	MT3 /CL2	26.0
128145	188	2:6:2.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128647	190	1:57:30.0	POINT_RESPONSE_542	MT3 /CL2	26.0
128146	188	2:9:54.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128648	190	2:15:27.0	POINT_RESPONSE_542	MT3 /CL2	26.0
128147	188	2:13:33.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128649	190	2:33:24.0	POINT_RESPONSE_542	MT3 /CL2	26.0
128149	188	2:22:54.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128650	190	2:51:22.0	POINT_RESPONSE_542	MT3 /CL2	26.0
128150	188	2:32:30.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128652	190	3:26:55.0	POINT_RESPONSE_542	MT3 /CL2	25.0
128151	188	2:33:40.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128654	190	4:5:11.0	POINT_RESPONSE_542	MT3 /CL2	26.0
128152	188	2:35:5.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128659	190	4:38:23.0	POINT_RESPONSE_544	MT3 /IRP0	26.0
128153	188	2:36:39.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128660	190	4:39:33.0	POINT_RESPONSE_544	MT3 /IRP0	26.0
128155	188	2:45:18.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128661	190	4:40:58.0	POINT_RESPONSE_544	MT3 /IRP0	26.0
128156	188	2:50:59.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128662	190	4:42:32.0	POINT_RESPONSE_544	MT3 /IRP0	26.0
128158	188	2:53:44.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128663	190	4:45:1.0	POINT_RESPONSE_544	MT3 /IRP0	26.0
128159	188	2:55:18.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128664	190	4:49:8.0	POINT_RESPONSE_544	MT3 /IRP0	26.0
128160	188	2:57:47.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128665	190	4:58:33.0	POINT_RESPONSE_544	MT3 /IRP0	26.0
128161	188	3:1:54.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128666	190	5:7:58.0	POINT_RESPONSE_544	MT3 /IRP0	26.0
128163	188	3:20:56.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128667	190	5:25:57.0	POINT_RESPONSE_544	MT3 /IRP0	27.0
128164	188	3:38:55.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128668	190	5:43:54.0	POINT_RESPONSE_544	MT3 /IRP0	26.0
128166	188	4:18:9.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128669	190	6:4:59.0	POINT_RESPONSE_544	MT3 /IRP0	27.0
128167	188	4:23:20.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128670	190	6:10:10.0	POINT_RESPONSE_544	MT3 /IRP0	27.0
128168	188	4:44:25.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128671	190	6:31:15.0	POINT_RESPONSE_544	MT3 /IRP0	27.0
128169	188	5:5:30.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128672	190	6:52:20.0	POINT_RESPONSE_544	MT3 /IRP0	27.0
128170	188	5:26:37.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128673	190	7:13:27.0	POINT_RESPONSE_544	MT3 /IRP0	27.0
128171	188	5:42:54.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128680	190	8:14:38.0	POINT_RESPONSE_540	CLL /BL1	27.0
128172	188	5:52:19.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128681	190	8:16:7.0	POINT_RESPONSE_540	CLL /BL1	27.0
128173	188	6:10:16.0	POINT_RESPONSE_524	MT3 /IRP0	8.0	128682	190	8:17:17.0	POINT_RESPONSE_540	CLL /BL1	27.0
128174	188	6:20:58.0	POINT_RESPONSE_522	MT3 /CL2	8.0	128683	190	8:18:57.0	POINT_RESPONSE_540	CLL /BL1	27.0
128178	188	6:53:54.0	POINT_RESPONSE_522	MT3 /CL2	8.0	128684	190	8:20:22.0	POINT_RESPONSE_540	CLL /BL1	27.0
128179	188	6:59:51.0	POINT_RESPONSE_522	MT3 /CL2	8.0	128685	190	8:21:56.0	POINT_RESPONSE_540	CLL /BL1	27.0
128180	188	7:1:1.0	POINT_RESPONSE_522	MT3 /CL2	8.0	128686	190	8:24:25.0	POINT_RESPONSE_540	CLL /BL1	27.0
128181	188	7:2:42.0	POINT_RESPONSE_522	MT3 /CL2	8.0	128687	190	8:28:23.0	POINT_RESPONSE_540	CLL /BL1	27.0
128182	188	7:4:22.0	POINT_RESPONSE_522	MT3 /CL2	8.0	128688	190	8:33:25.0	POINT_RESPONSE_540	CLL /BL1	27.0
128183	188	7:6:26.0	POINT_RESPONSE_522	MT3 /CL2	8.0	128689	190	8:42:50.0	POINT_RESPONSE_540	CLL /BL1	27.0
128184	188	7:8:49.0	POINT_RESPONSE_522	MT3 /CL2	8.0	128690	190	9:0:47.0	POINT_RESPONSE_540	CLL /BL1	27.0
128187	188	7:40:34.0	POINT_RESPONSE_522	MT3 /CL2	8.0	128705	190	11:27:8.0	POINT_RESPONSE_545	IR4 /CL2	26.0
128188	188	7:58:31.0	POINT_RESPONSE_522	MT3 /CL2	8.0	128706	190	11:28:26.0	POINT_RESPONSE_545	IR4 /CL2	26.0
128189	188	8:16:28.0	POINT_RESPONSE_522	MT3 /CL2	8.0	128707	190	11:30:7.0	POINT_RESPONSE_545	IR4 /CL2	26.0
128190	188	8:34:25.0	POINT_RESPONSE_522	MT3 /CL2	8.0	128709	190	11:35:49.0	POINT_RESPONSE_545	IR4 /CL2	26.0
128191	188	8:55:33.0	POINT_RESPONSE_522	MT3 /CL2	8.0	128710	190	11:40:58.0	POINT_RESPONSE_545	IR4 /CL2	26.0
128192	188	9:4:58.0	POINT_RESPONSE_522	MT3 /CL2	8.0	128711	190	11:50:23.0	POINT_RESPONSE_545	IR4 /CL2	26.0
128201	188	9:42:22.0	POINT_RESPONSE_521	CLL /CL2	8.0	128712	190	11:59:50.0	POINT_RESPONSE_545	IR4 /CL2	26.0
128202	188	9:43:52.0	POINT_RESPONSE_521	CLL /CL2	8.0	128714	190	12:35:55.0	POINT_RESPONSE_545	IR4 /CL2	26.0
128203	188	9:45:21.0	POINT_RESPONSE_521	CLL /CL2	8.0	128715	190	12:57:2.0	POINT_RESPONSE_545	IR4 /CL2	26.0
128204	188	9:46:50.0	POINT_RESPONSE_521	CLL /CL2	8.0	128716	190	13:18:9.0	POINT_RESPONSE_545	IR4 /CL2	26.0
128205	188	9:48:19.0	POINT_RESPONSE_521	CLL /CL2	8.0	128717	190	13:39:16.0	POINT_RESPONSE_545	IR4 /CL2	26.0
128207	188	9:54:16.0	POINT_RESPONSE_521	CLL /CL2	8.0	128718	190	14:0:23.0	POINT_RESPONSE_545	IR4 /CL2	26.0
128208	188	9:55:57.0	POINT_RESPONSE_521	CLL /CL2	8.0	128719	190	14:21:30.0	POINT_RESPONSE_545	IR4 /CL2	

Image	day	eventtime	observation	filters	temp	Image	day	eventtime	observation	filters	temp
128738	190	18:28:30.0	POINT_RESPONSE_546	CL1 /CL2	26.0	128759	190	19:43:41.0	POINT_RESPONSE_547	CL1 /BL1	26.0
128739	190	18:33:48.0	POINT_RESPONSE_546	CL1 /CL2	26.0	128760	190	19:46:20.0	POINT_RESPONSE_547	CL1 /BL1	26.0
128740	190	18:36:28.0	POINT_RESPONSE_546	CL1 /CL2	27.0	128763	190	20:5:15.0	POINT_RESPONSE_548	CB3 /CL2	26.0
128741	190	18:39:57.0	POINT_RESPONSE_546	CL1 /CL2	27.0	128764	190	20:8:15.0	POINT_RESPONSE_548	CB3 /CL2	26.0
128742	190	18:42:44.0	POINT_RESPONSE_546	CL1 /CL2	27.0	128765	190	20:10:51.0	POINT_RESPONSE_548	CB3 /CL2	26.0
128743	190	18:46:6.0	POINT_RESPONSE_546	CL1 /CL2	26.0	128766	190	20:13:8.0	POINT_RESPONSE_548	CB3 /CL2	26.0
128744	190	18:49:51.0	POINT_RESPONSE_546	CL1 /CL2	26.0	128768	190	20:17:13.0	POINT_RESPONSE_548	CB3 /CL2	26.0
128746	190	18:54:36.0	POINT_RESPONSE_546	CL1 /CL2	26.0	128769	190	20:20:48.0	POINT_RESPONSE_548	CB3 /CL2	26.0
128752	190	19:25:24.0	POINT_RESPONSE_547	CL1 /BL1	26.0	128770	190	20:23:14.0	POINT_RESPONSE_548	CB3 /CL2	26.0
128753	190	19:28:41.0	POINT_RESPONSE_547	CL1 /BL1	27.0	128772	190	20:27:24.0	POINT_RESPONSE_548	CB3 /CL2	26.0
128755	190	19:32:48.0	POINT_RESPONSE_547	CL1 /BL1	26.0	128773	190	20:30:6.0	POINT_RESPONSE_548	CB3 /CL2	26.0
128756	190	19:35:21.0	POINT_RESPONSE_547	CL1 /BL1	26.0						
128757	190	19:37:51.0	POINT_RESPONSE_547	CL1 /BL1	26.0						
128758	190	19:41:1.0	POINT_RESPONSE_547	CL1 /BL1	27.0						