

5.2.2 POINT RESPONSE FUNCTION

5.2.2.1 NAC FM PRF CALIBRATION RESULTS

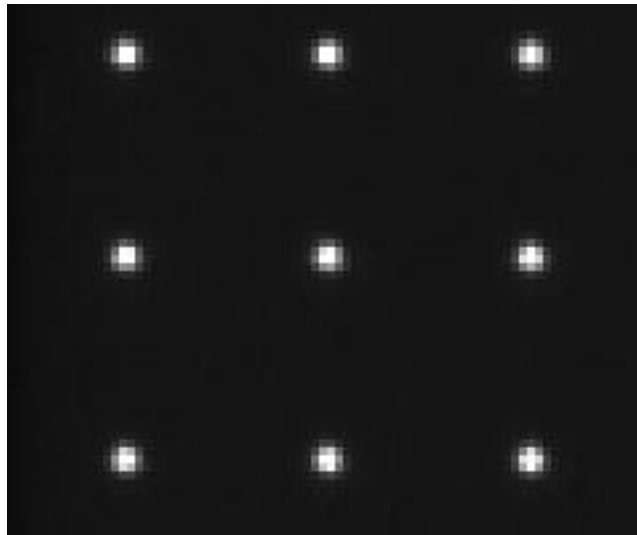
As reported in Reference 5.2.2.1-1

Reference 5.2.2.1-1 - IOM 388-PAG-CCA98-5, "NAC FM Calibration Results: Point Response Function", C. Avis, March 11, 1998

5.2.2.1.1 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 40x40 grid of pinholes covering the entire image area. The holes were about 25.25 pixels apart arranged in more-or-less horizontal rows. The following image shows the upper left corner of an image scaled by 4 times.



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 ON. The detector was at -90° C and the chamber was at -10° C, $+5^{\circ}$ C or $+25^{\circ}$ C. The following filter combinations were tested: CL1/CL2, BL1/CL2, CL1/IR3, CL1/CB3, CL1/MT1, and IRP0/CB3.

5.2.2.1.2 METHOD

Each image was searched for all star-like objects after having dark-current removed. The dark-current frame used was actually an average of three PRF exposures which were miss-timed such that they missed the flash of the illuminant. In most frames, all 1600 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)

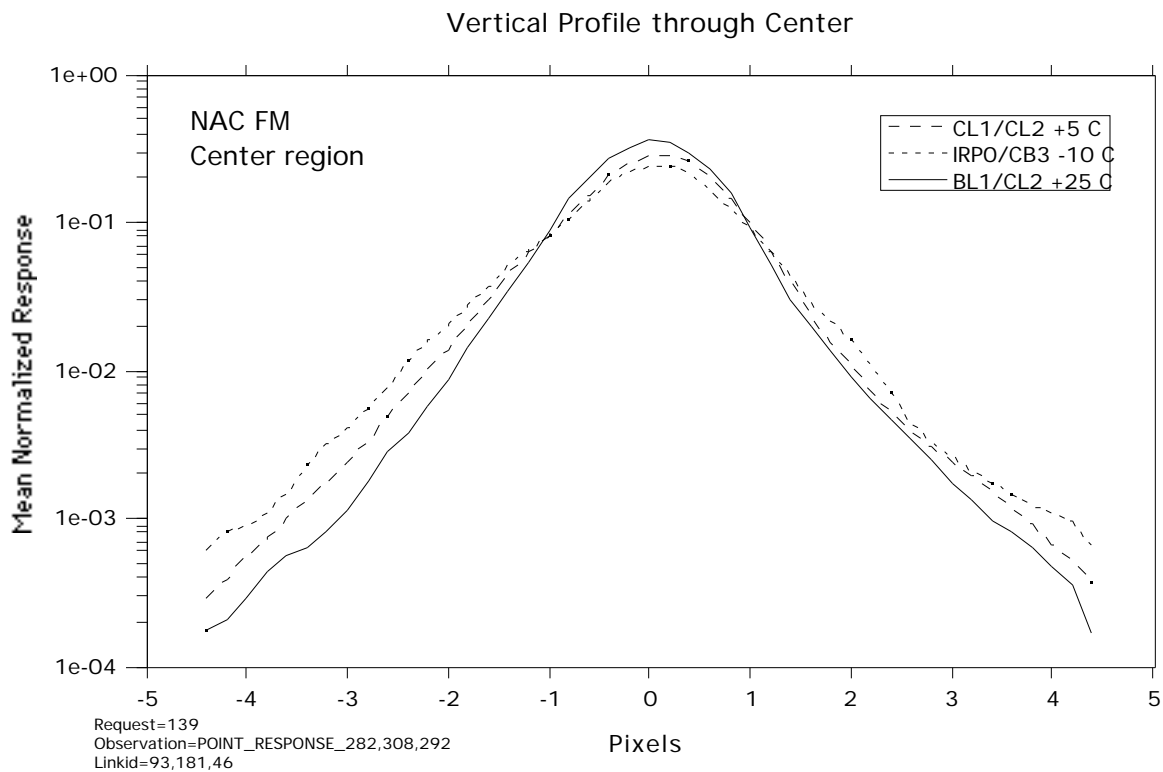
For every selected set of data, the normalized responses were combined into a mean normalized point response image. This process began with the construction of a 50x50 array of bins. The exact centroid of each point was defined to fall into bin (25,25). For each point in the selected set of data, the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

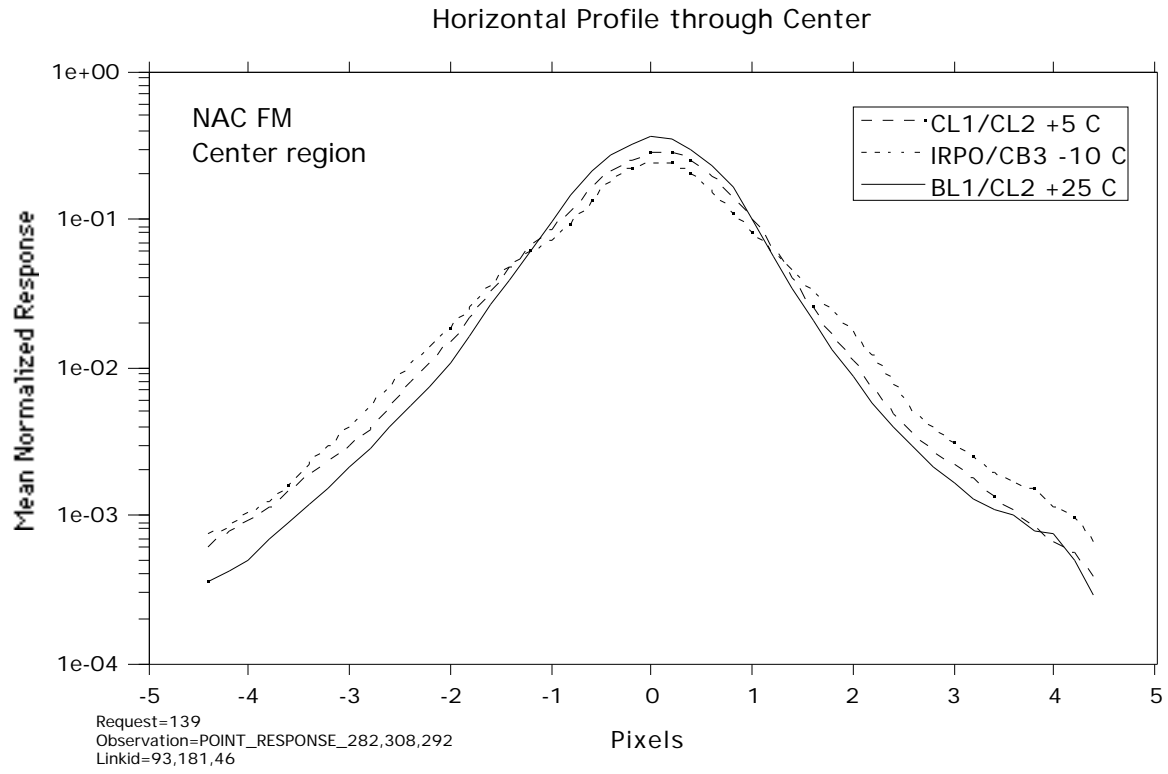
- for each pixel in the 9x9 area around each point
 1. calculate the delta i and delta j from the point's centroid
 2. scale these deltas by 5
 3. place this pixel's NDN in the bin with the appropriate delta i and delta j from the center of the 50x50 array

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.

5.2.2.1.3 RESPONSE PROFILES AND CONTOURS

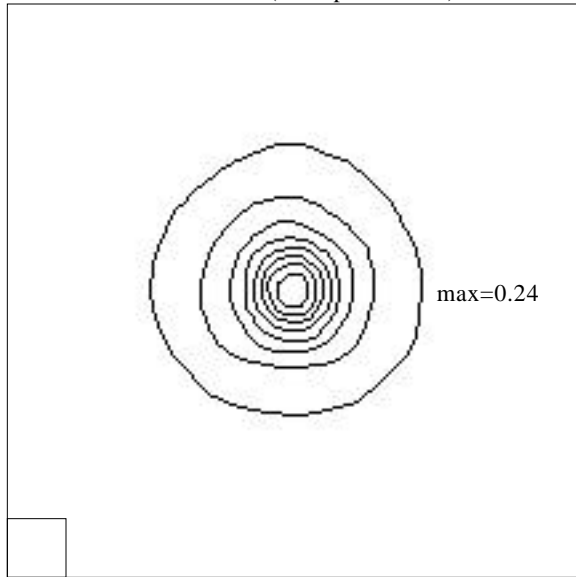
The following plots show the range of response functions encountered in this analysis. Examples of the highest, lowest and typical responses are shown below in both horizontal and vertical profiles.



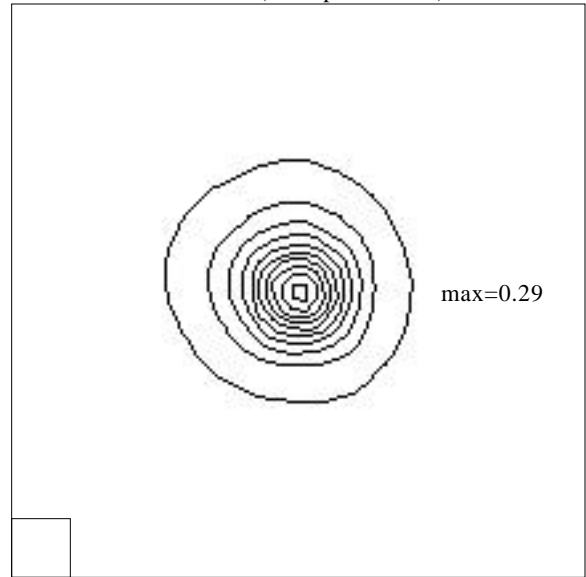


The following contour plots are for the same responses that are plotted above. All use the same scale and contour spacing (starting at .01 and increasing in .03 steps). A one-pixel square box in the corner illustrates the scale.

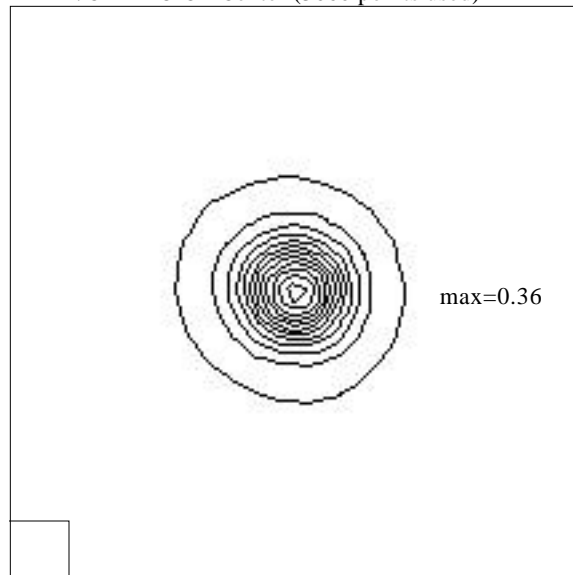
IRP0/CB3 -10 C - Center (3300 points used)



CL1/CL2 +5 C - Center (3660 points used)



BL1/CL2 +25 C - Center (3660 points used)



5.2.2.1.4 PEAK VALUES

The table below compares the peak mean normalized response for all filter combinations tested at all three test temperatures. The analysis gave a typical standard deviation of about 0.0002. Note that the peak value for all filters increased with temperature, but much more in the BL1/CL2 than the others.

Peak Values - Center

Filter	-10° C	+5° C	+25° C
CL1/MT1	.32	.34	.35
BL1/CL2	.28	.31	.36
CL1/CL2	.28	.29	.31
IRP0/CB3	.24	.25	.25
CL1/IR3	.23	.24	.26
CL1/CB3	.23	.24	.25

Peak Values - Upper left

Filter	-10° C	+5° C	+25° C
CL1/MT1	.35	.36	.35
BL1/CL2	.32	.34	.36
CL1/CL2	.31	.31	.31
IRP0/CB3	.25	.25	.25
CL1/IR3	.25	.25	.25
CL1/CB3	.25	.25	.25

Peak Values - Upper right

Filter	-10° C	+5° C	+25° C
CL1/MT1	.29	.31	.33
BL1/CL2	.26	.28	.32
CL1/CL2	.26	.26	.30
IRP0/CB3	.23	.23	.24
CL1/IR3	.23	.23	.25
CL1/CB3	.22	.22	.24

Peak Values - Lower left

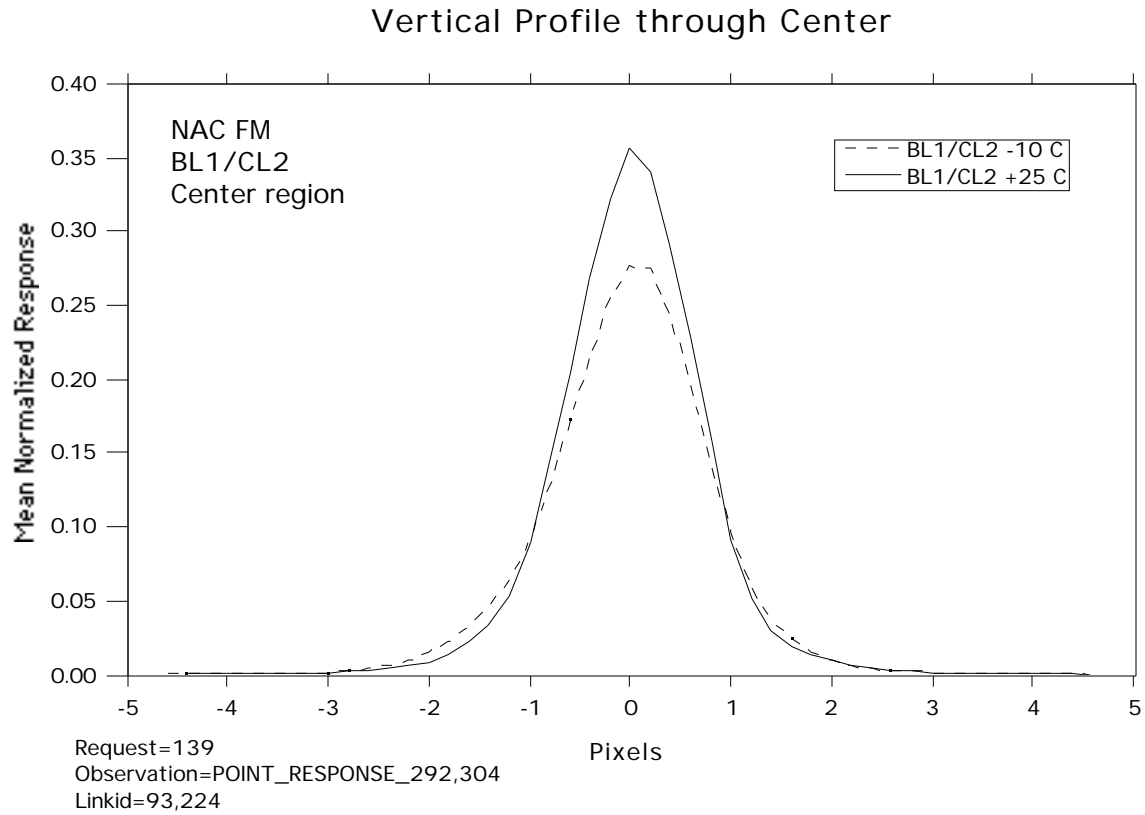
Filter	-10° C	+5° C	+25° C
CL1/MT1	.33	.34	.34
BL1/CL2	.32	.32	.35
CL1/CL2	.30	.28	.30
IRP0/CB3	.24	.24	.24
CL1/IR3	.24	.24	.25
CL1/CB3	.24	.24	.24

Peak Values - Lower right

Filter	-10° C	+5° C	+25° C
CL1/MT1	.28	.30	.33
BL1/CL2	.25	.28	.32
CL1/CL2	.26	.27	.29
IRP0/CB3	.22	.23	.24
CL1/IR3	.22	.23	.24
CL1/CB3	.22	.23	.24

5.2.2.1.5 TEMPERATURE DEPENDENCE

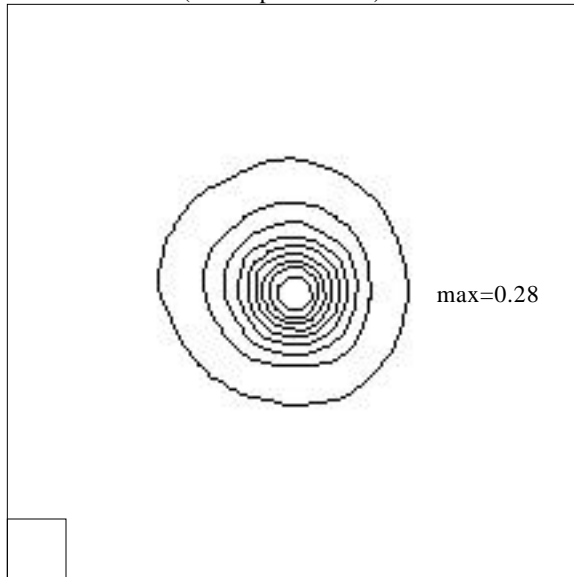
The significant change in the BL1/CL2 response with temperature is illustrated below. The plotted profiles include those for response at -10°C and at $+25^{\circ}\text{C}$ for the center region of the image.



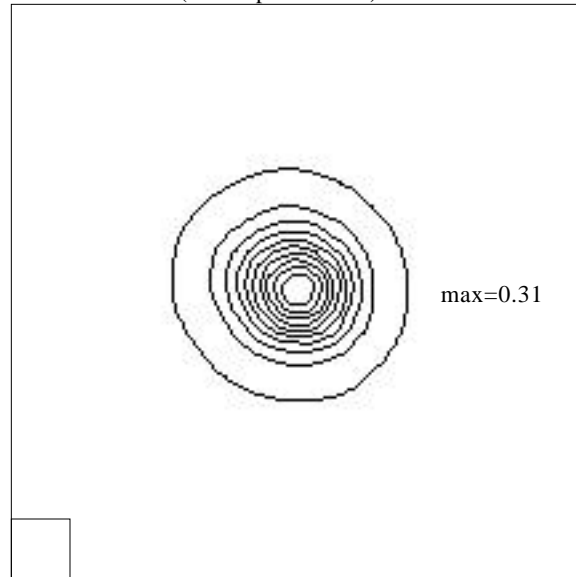
5.2.2.1.6 FRAMEWIDE MEAN RESULTS

The following results are for +5° C data but include points from the entire image area for each filter combination tested. This means up to 1600 points from each image in each filter. Each contour plot uses the same scale and contour levels (starting at .01 and increasing in .03 steps).

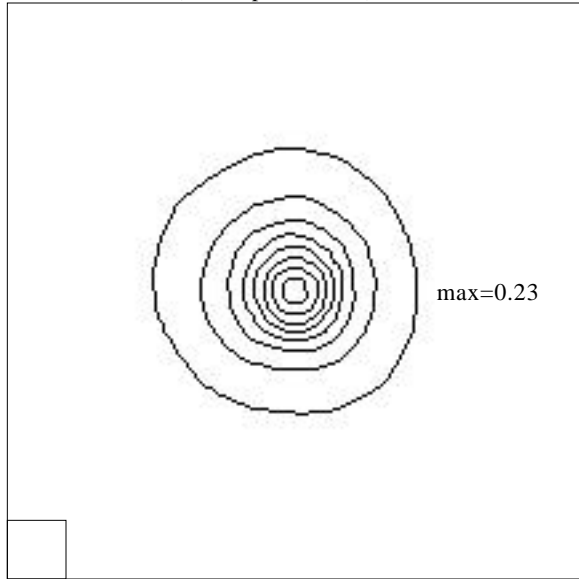
CL1/CL2 +5° C (14280 points used)



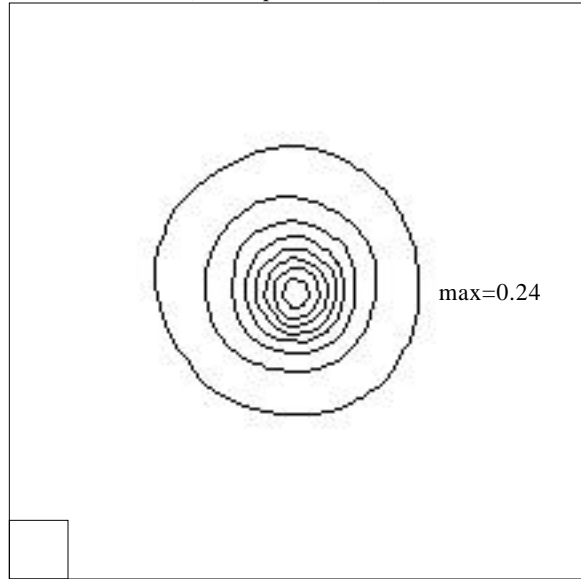
BL1/CL2 +5° C (15720 points used)



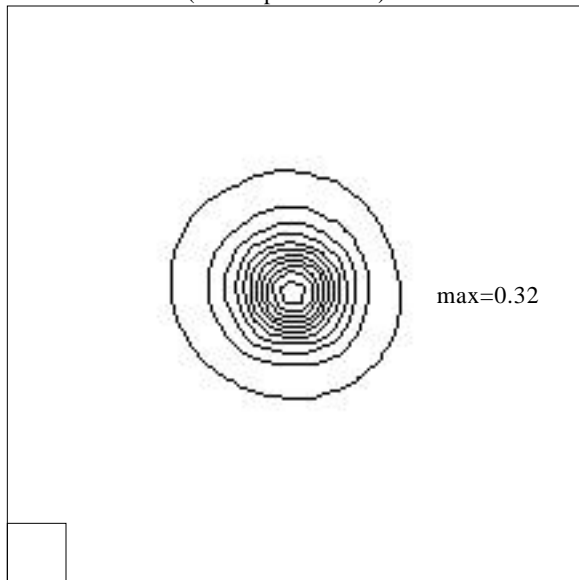
CL1/IR3 +5° C (14320 points used)



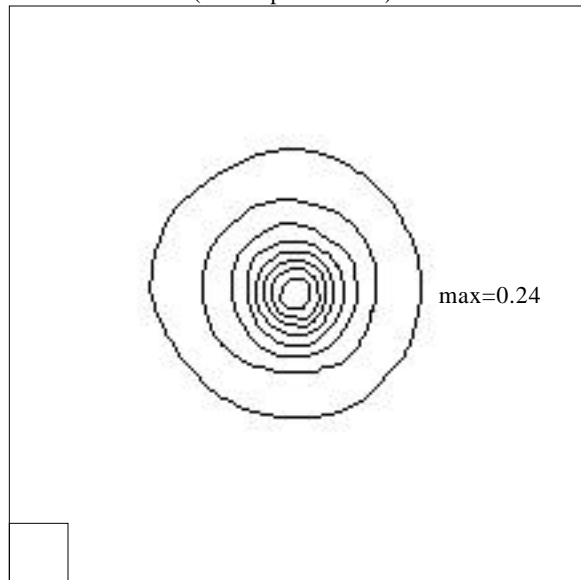
CL1/CB3 +5° C (12640 points used)



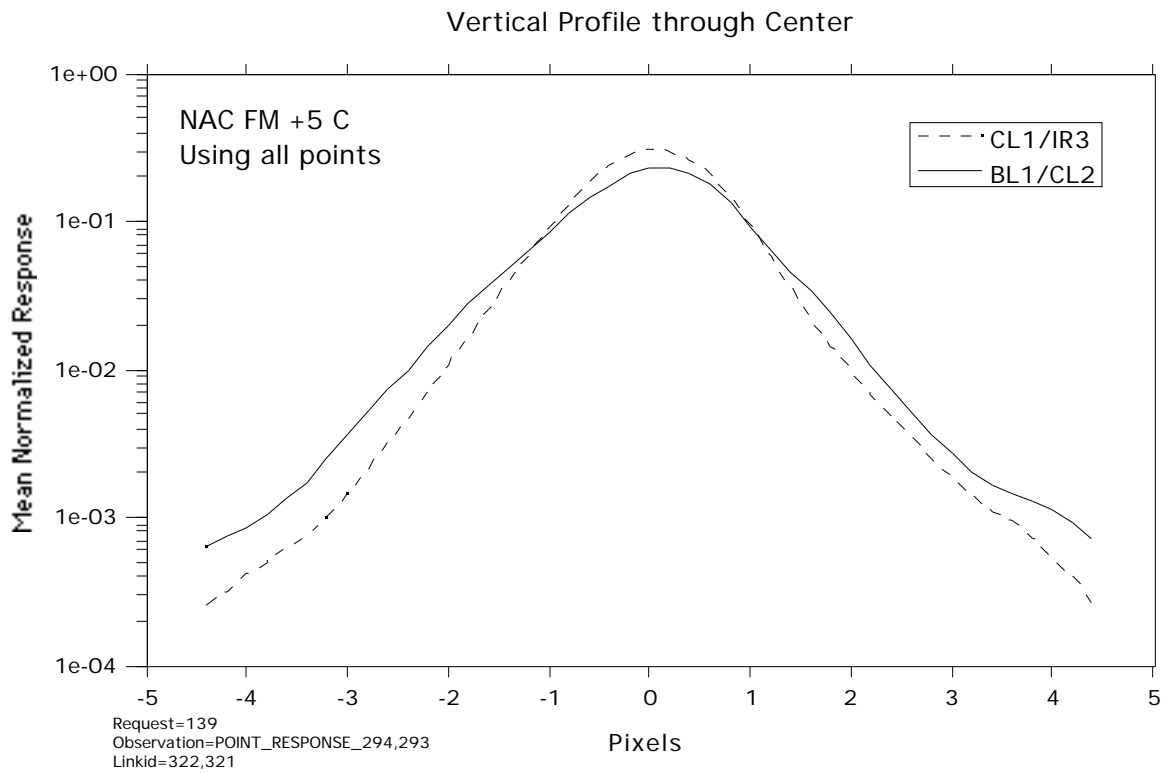
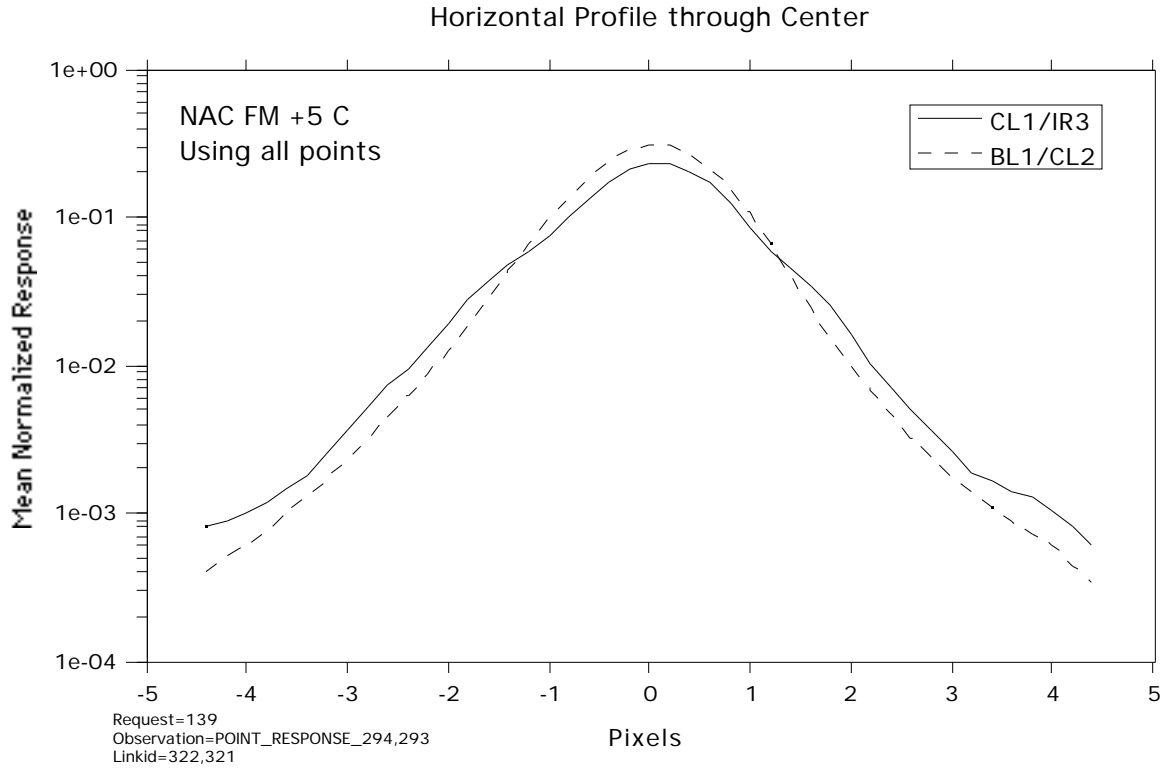
CL1/MT1 +5° C (12720 points used)



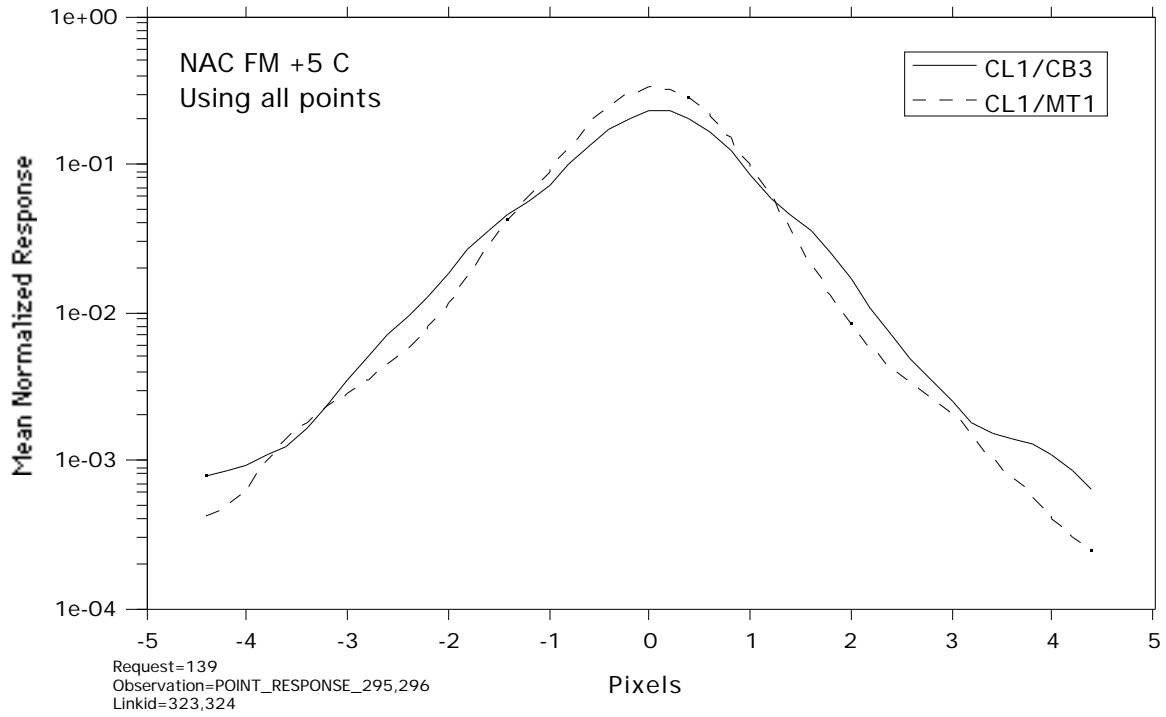
IRP0/CB3 +5° C (12520 points used)



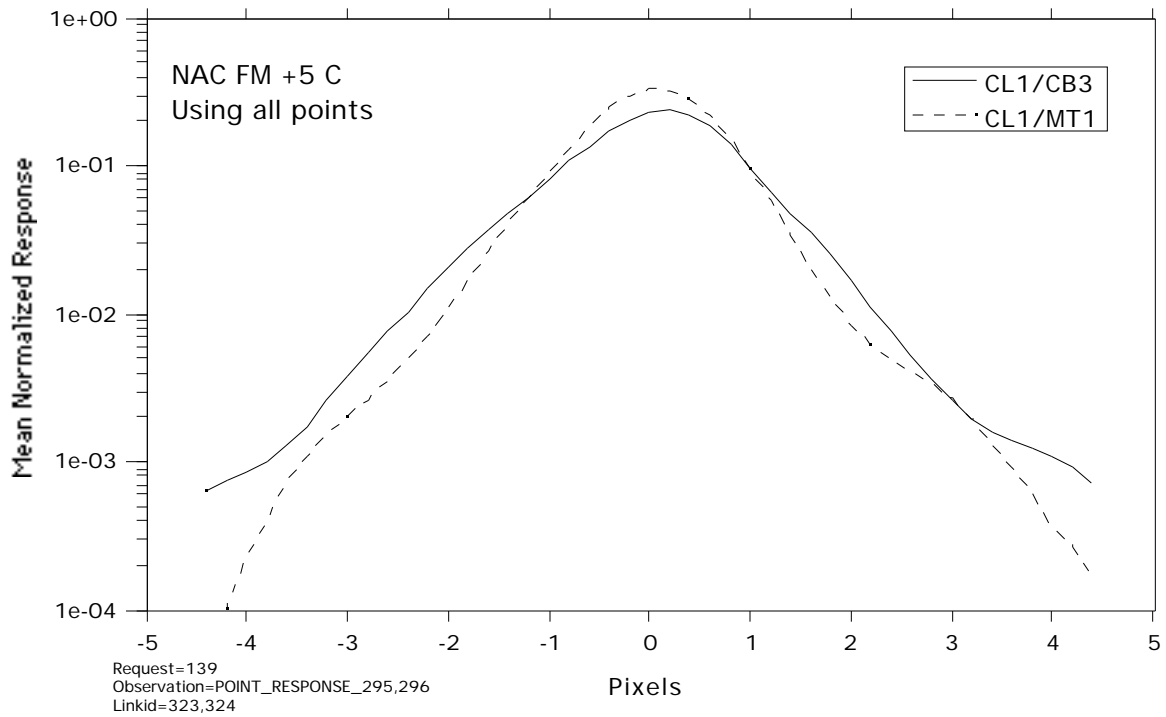
The following line plots are for the same data shown in the above contour plots. There are two filters on each plot for easy readability.



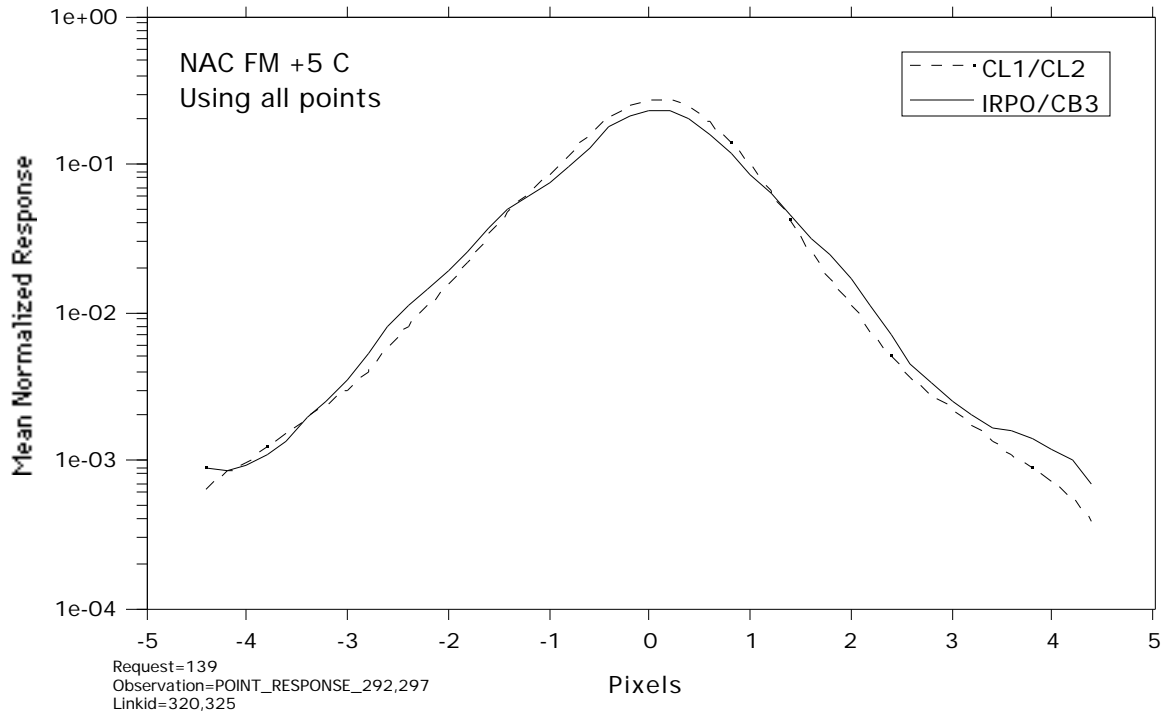
Horizontal Profile through Center



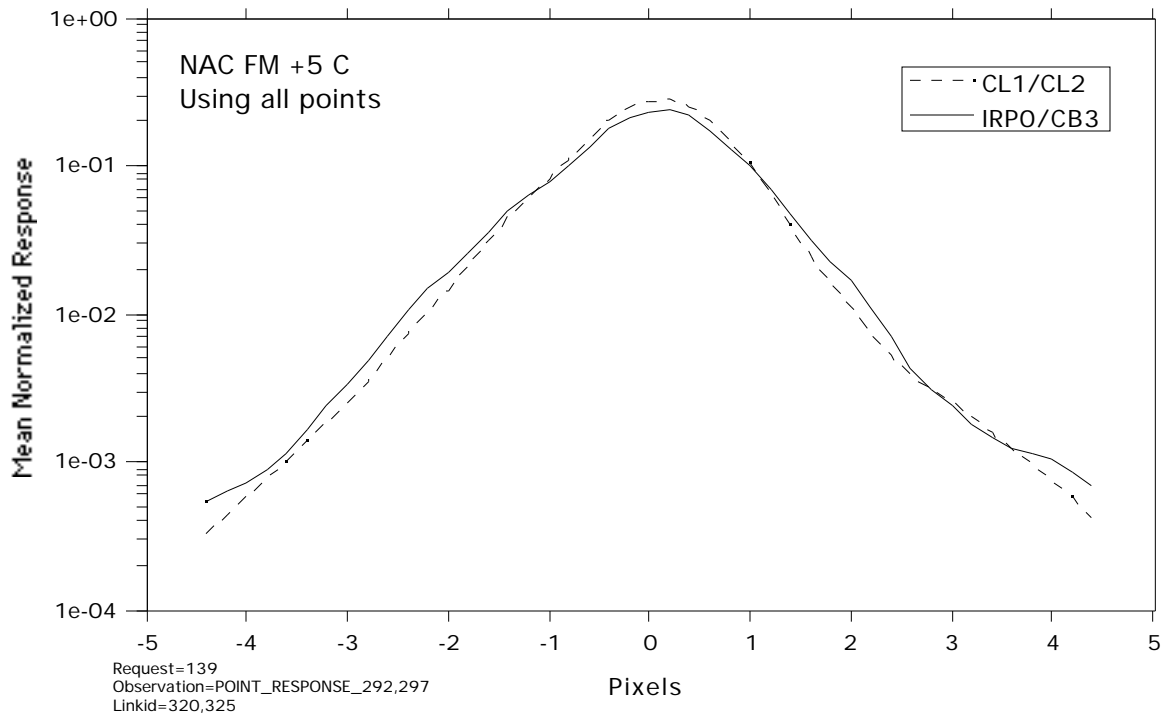
Vertical Profile through Center



Horizontal Profile through Center



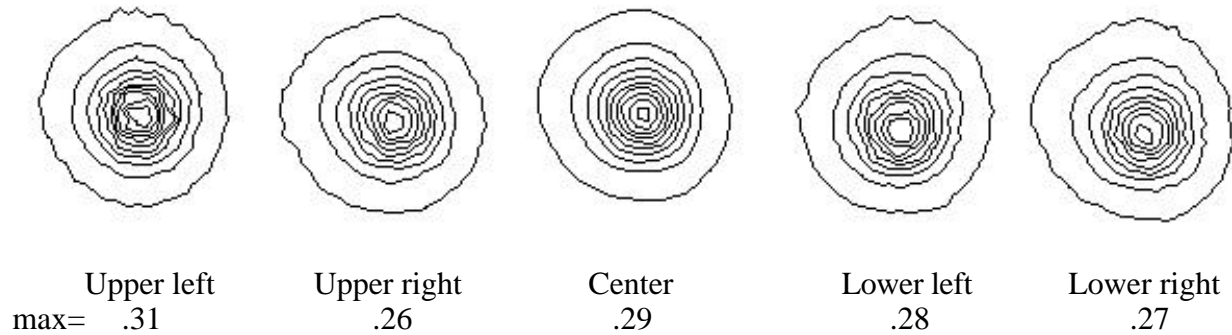
Vertical Profile through Center



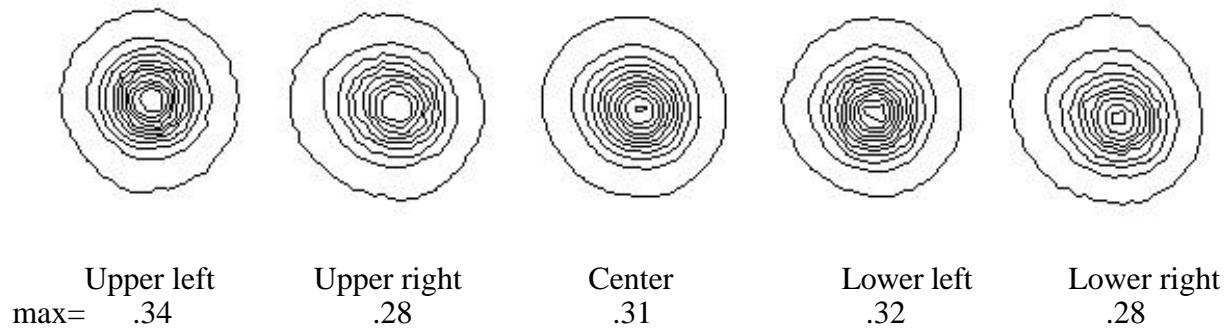
5.2.2.1.7 DEPENDENCE UPON POSITION

To compare the quality of the PRF as a function of position within the image, points were selected from the center and the four corner regions. The following contour plots are for +5° C only, and are for three selected filters (CL1/CL2, BL1/CL2, and CL1/IR3). The center region was larger and thus used many more points, so it has a smoother appearance. Note that there is no significant shape variation among the regions.

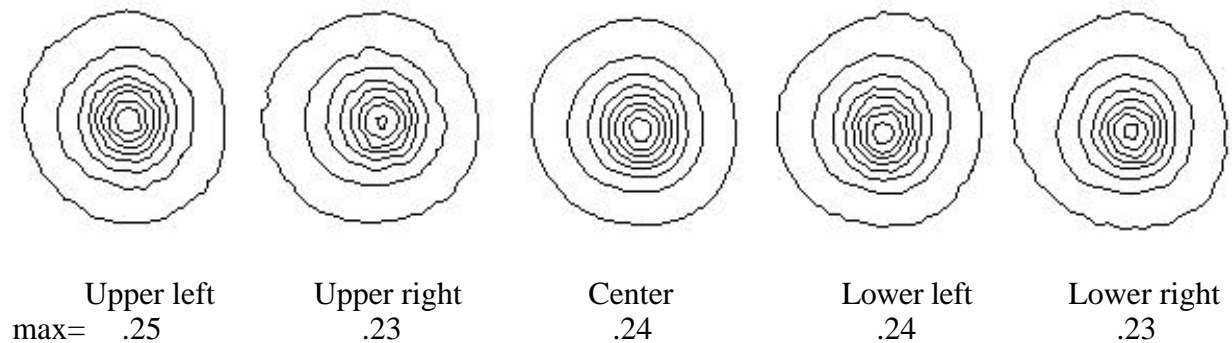
CL1/CL2 +5° C (.03 intervals)



BL1/CL2 +5° C (.03 intervals)



CL1/IR3 +5° C (.03 intervals)



5.2.2.1.8 CONCLUSIONS

1. The response peaks generally increase slightly with higher temperature. However, the increase for the CL1/BL1 case is significantly more than the others.
2. The PRF does not differ significantly among the various regions of the image.
3. No significant elongation of the points occurred in any image region.
4. The CL1/MT1 had the highest response peak, followed by BL1/CL2 and CL1/CL2 with IRP0/CB3, CL1/IR3 and CL1/CB3 with much lower values.

5.2.2.1.9 List of frames used in PRF analysis

image	day	eventtime	observation	filters	temp							
117843	127	13:3:7.0	POINT_RESPONSE_310	CL1 /CL2	26.0	117945	128	0:32:9.0	POINT_RESPONSE_281	IRP0/MT3	26.0	
117844	127	13:12:22.0	POINT_RESPONSE_310	CL1 /CL2	26.0	117946	128	0:33:19.0	POINT_RESPONSE_281	IRP0/MT3	26.0	
117845	127	13:24:56.0	POINT_RESPONSE_310	CL1 /CL2	26.0	117947	128	0:34:44.0	POINT_RESPONSE_281	IRP0/MT3	26.0	
117846	127	13:26:9.0	POINT_RESPONSE_310	CL1 /CL2	26.0	117948	128	0:36:18.0	POINT_RESPONSE_281	IRP0/MT3	26.0	
117847	127	13:29:4.0	POINT_RESPONSE_310	CL1 /CL2	26.0	117949	128	0:38:47.0	POINT_RESPONSE_281	IRP0/MT3	26.0	
117848	127	13:46:8.0	POINT_RESPONSE_282	BL1 /CL2	26.0	117950	128	0:42:54.0	POINT_RESPONSE_281	IRP0/MT3	26.0	
117850	127	13:52:21.0	POINT_RESPONSE_282	BL1 /CL2	26.0	117951	128	0:52:19.0	POINT_RESPONSE_281	IRP0/MT3	26.0	
117851	127	13:55:34.0	POINT_RESPONSE_282	BL1 /CL2	26.0	117952	128	1:1:44.0	POINT_RESPONSE_281	IRP0/MT3	26.0	
117852	127	13:57:57.0	POINT_RESPONSE_282	BL1 /CL2	26.0	117953	128	1:19:43.0	POINT_RESPONSE_281	IRP0/MT3	26.0	
117853	127	13:59:52.0	POINT_RESPONSE_282	BL1 /CL2	26.0	117954	128	1:37:40.0	POINT_RESPONSE_281	IRP0/MT3	26.0	
117854	127	14:3:38.0	POINT_RESPONSE_283	CL1 /IR3	26.0	117955	128	1:58:45.0	POINT_RESPONSE_281	IRP0/MT3	26.0	
117856	127	14:11:16.0	POINT_RESPONSE_283	CL1 /IR3	26.0	117956	128	2:3:57.0	POINT_RESPONSE_281	IRP0/MT3	26.0	
117857	127	14:12:56.0	POINT_RESPONSE_283	CL1 /IR3	26.0	117957	128	2:25:2.0	POINT_RESPONSE_281	IRP0/MT3	26.0	
117858	127	14:14:39.0	POINT_RESPONSE_284	CL1 /CB3	26.0	117958	128	2:46:7.0	POINT_RESPONSE_281	IRP0/MT3	26.0	
117859	127	14:17:34.0	POINT_RESPONSE_284	CL1 /CB3	26.0	117959	128	3:7:14.0	POINT_RESPONSE_281	IRP0/MT3	26.0	
117860	127	14:20:11.0	POINT_RESPONSE_284	CL1 /CB3	26.0	117960	128	3:18:37.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117861	127	14:22:29.0	POINT_RESPONSE_284	CL1 /CB3	26.0	117961	128	3:20:6.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117862	127	14:28:22.0	POINT_RESPONSE_284	CL1 /CB3	26.0	117962	128	3:21:16.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117864	127	14:35:7.0	POINT_RESPONSE_285	CL1 /MT1	26.0	117963	128	3:22:56.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117865	127	14:37:19.0	POINT_RESPONSE_285	CL1 /MT1	26.0	117964	128	3:24:21.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117868	127	14:51:32.0	POINT_RESPONSE_285	CL1 /MT1	26.0	117965	128	3:25:55.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117869	127	14:53:46.0	POINT_RESPONSE_285	CL1 /MT1	26.0	117966	128	3:28:24.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117870	127	15:1:5.0	POINT_RESPONSE_285	CL1 /MT1	26.0	117967	128	3:32:22.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117871	127	15:2:46.0	POINT_RESPONSE_285	CL1 /MT1	26.0	117968	128	3:37:24.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117872	127	15:4:16.0	POINT_RESPONSE_285	CL1 /MT1	26.0	117969	128	3:46:49.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117874	127	15:8:49.0	POINT_RESPONSE_286	IRP0/CB3	26.0	117970	128	4:4:46.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117876	127	15:12:28.0	POINT_RESPONSE_286	IRP0/CB3	26.0	117971	128	7:42:23.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117877	127	15:14:16.0	POINT_RESPONSE_286	IRP0/CB3	26.0	117972	128	7:43:52.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117878	127	15:15:45.0	POINT_RESPONSE_286	IRP0/CB3	26.0	117973	128	7:45:3.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117879	127	15:17:17.0	POINT_RESPONSE_286	IRP0/CB3	26.0	117974	128	7:46:43.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117880	127	15:19:49.0	POINT_RESPONSE_286	IRP0/CB3	26.0	117975	128	7:48:7.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117881	127	15:21:32.0	POINT_RESPONSE_286	IRP0/CB3	26.0	117976	128	7:49:41.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117882	127	15:23:12.0	POINT_RESPONSE_286	IRP0/CB3	26.0	117977	128	7:52:10.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117883	127	15:31:26.0	POINT_RESPONSE_284	CL1 /CB3	26.0	117978	128	7:56:8.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117884	127	15:33:44.0	POINT_RESPONSE_284	CL1 /CB3	26.0	117979	128	8:1:11.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117885	127	15:35:26.0	POINT_RESPONSE_284	CL1 /CB3	26.0	117980	128	8:10:35.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117886	127	15:37:2.0	POINT_RESPONSE_284	CL1 /CB3	26.0	117982	128	8:56:45.0	POINT_RESPONSE_277	BL1 /CL2	26.0	
117887	127	15:40:41.0	POINT_RESPONSE_283	CL1 /IR3	26.0	117985	128	9:58:6.0	POINT_RESPONSE_278	CL1 /CL2	26.0	
117888	127	15:42:16.0	POINT_RESPONSE_283	CL1 /IR3	26.0	118046	130	1:7:13.0	POINT_RESPONSE_288	CL1 /CL2	6.0	
117889	127	15:43:46.0	POINT_RESPONSE_283	CL1 /IR3	26.0	118047	130	1:8:42.0	POINT_RESPONSE_288	CL1 /CL2	6.0	
117891	127	15:47:19.0	POINT_RESPONSE_283	CL1 /IR3	26.0	118048	130	1:10:11.0	POINT_RESPONSE_288	CL1 /CL2	6.0	
117892	127	15:51:27.0	POINT_RESPONSE_282	BL1 /CL2	26.0	118049	130	1:11:41.0	POINT_RESPONSE_288	CL1 /CL2	6.0	
117893	127	15:53:3.0	POINT_RESPONSE_282	BL1 /CL2	26.0	118050	130	1:13:10.0	POINT_RESPONSE_288	CL1 /CL2	6.0	
117894	127	15:56:12.0	POINT_RESPONSE_282	BL1 /CL2	26.0	118051	130	1:14:39.0	POINT_RESPONSE_288	CL1 /CL2	6.0	
117895	127	15:57:54.0	POINT_RESPONSE_282	BL1 /CL2	26.0	118052	130	1:15:55.0	POINT_RESPONSE_288	CL1 /CL2	6.0	
117905	127	19:2:14.0	POINT_RESPONSE_278	CL1 /CL2	26.0	118053	130	1:17:35.0	POINT_RESPONSE_288	CL1 /CL2	6.0	
117906	127	19:3:43.0	POINT_RESPONSE_278	CL1 /CL2	26.0	118054	130	1:18:52.0	POINT_RESPONSE_288	CL1 /CL2	6.0	
117907	127	19:5:12.0	POINT_RESPONSE_278	CL1 /CL2	26.0	118055	130	1:20:26.0	POINT_RESPONSE_288	CL1 /CL2	6.0	
117908	127	19:6:41.0	POINT_RESPONSE_278	CL1 /CL2	26.0	118056	130	1:22:16.0	POINT_RESPONSE_288	CL1 /CL2	6.0	
117909	127	19:8:10.0	POINT_RESPONSE_278	CL1 /CL2	26.0	118057	130	1:25:15.0	POINT_RESPONSE_290	IR4 /CL2	6.0	
117910	127	19:9:39.0	POINT_RESPONSE_278	CL1 /CL2	26.0	118058	130	1:58:17.0	POINT_RESPONSE_290	IR4 /CL2	6.0	
117911	127	19:10:56.0	POINT_RESPONSE_278	CL1 /CL2	26.0	118059	130	1:59:27.0	POINT_RESPONSE_290	IR4 /CL2	6.0	
117912	127	19:12:36.0	POINT_RESPONSE_278	CL1 /CL2	26.0	118060	130	2:0:52.0	POINT_RESPONSE_290	IR4 /CL2	6.0	
117914	127	19:16:21.0	POINT_RESPONSE_278	CL1 /CL2	26.0	118061	130	2:2:26.0	POINT_RESPONSE_290	IR4 /CL2	6.0	
117915	127	19:18:43.0	POINT_RESPONSE_278	CL1 /CL2	26.0	118062	130	2:4:55.0	POINT_RESPONSE_290	IR4 /CL2	6.0	
117916	127	19:25:41.0	POINT_RESPONSE_278	CL1 /CL2	26.0	118063	130	2:7:58.0	POINT_RESPONSE_290	IR4 /CL2	6.0	
117917	127	19:39:8.0	POINT_RESPONSE_279	CL1 /MT3	26.0	118064	130	2:13:7.0	POINT_RESPONSE_290	IR4 /CL2	6.0	
117918	127	19:40:18.0	POINT_RESPONSE_279	CL1 /MT3	26.0	118065	130	2:22:32.0	POINT_RESPONSE_290	IR4 /CL2	6.0	
117919	127	19:41:58.0	POINT_RESPONSE_279	CL1 /MT3	26.0	118066	130	2:31:59.0	POINT_RESPONSE_290	IR4 /CL2	6.0	
117920	127	19:43:39.0	POINT_RESPONSE_279	CL1 /MT3	26.0	118067	130	2:49:56.0	POINT_RESPONSE_290	IR4 /CL2	6.0	
117922	127	19:48:5.0	POINT_RESPONSE_279	CL1 /MT3	26.0	118068	130	3:7:53.0	POINT_RESPONSE_290	IR4 /CL2	6.0	
117923	127	19:52:10.0	POINT_RESPONSE_279	CL1 /MT3	26.0	118069	130	3:29:0.0	POINT_RESPONSE_290	IR4 /CL2	6.0	
117925	127	20:19:42.0	POINT_RESPONSE_279	CL1 /MT3	26.0	118070	130	3:40:30.0	POINT_RESPONSE_289	CL1 /MT3	6.0	
117927	127	20:55:46.0	POINT_RESPONSE_279	CL1 /MT3	26.0	118071	130	3:41:40.0	POINT_RESPONSE_289	CL1 /MT3	6.0	
117928	127	21:13:43.0	POINT_RESPONSE_279	CL1 /MT3	26.0	118072	130	3:43:21.0	POINT_RESPONSE_289	CL1 /MT3	6.0	
117929	127	21:23:11.0	POINT_RESPONSE_279	CL1 /MT3	26.0	118073	130	3:45:1.0	POINT_RESPONSE_289	CL1 /MT3	6.0	
117930	127	21:32:36.0	POINT_RESPONSE_279	CL1 /MT3	26.0	118074	130	3:47:5.0	POINT_RESPONSE_289	CL1 /MT3	6.0	
117931	127	21:50:33.0	POINT_RESPONSE_279	CL1 /MT3	26.0	118075	130	3:49:28.0	POINT_RESPONSE_289	CL1 /MT3	6.0	
117932	127	22:4:27.0	POINT_RESPONSE_280	IR4 /CL2	26.0	118076	130	3:53:32.0	POINT_RESPONSE_289	CL1 /MT3	6.0	
117933	127	22:5:29.0	POINT_RESPONSE_280	IR4 /CL2	26.0	118077	130	4:2:57.0	POINT_RESPONSE_289	CL1 /MT3	6.0	
117934	127	22:6:39.0	POINT_RESPONSE_280	IR4 /CL2	26.0	118078	130	4:20:54.0	POINT_RESPONSE_289	CL1 /MT3	6.0	
117935	127	22:8:4.0	POINT_RESPONSE_280	IR4 /CL2	26.0	118079	130	4:38:51.0	POINT_RESPONSE_289	CL1 /MT3	6.0	
117936	127	22:9:38.0	POINT_RESPONSE_280	IR4 /CL2	26.0	118080	130	4:56:48.0	POINT_RESPONSE_289	CL1 /MT3	6.0	
117937	127	22:12:7.0	POINT_RESPONSE_280	IR4 /CL2	26.0	118081	130	5:14:45.0	POINT_RESPONSE_289	CL1 /MT3	6.0	
117938	127	22:15:10.0	POINT_RESPONSE_280	IR4 /CL2	26.0	118082	130	5:36:4.0	POINT_RESPONSE_287	BL1 /CL2	6.0	
117939	127	22:20:19.0	POINT_RESPONSE_280	IR4 /CL2	26.0	118083	130	5:37:33.0	POINT_RESPONSE_287	BL1 /CL2	6.0	
117940	127	22:29:44.0	POINT_RESPONSE_280	IR4 /CL2	26.0	118084	130	5:38:44.0	POINT_RESPONSE_287	BL1 /CL2	6.0	
117941	127	22:39:11.0	POINT_RESPONSE_280	IR4 /CL2	26.0	118085	130	5:40:24.0	POINT_RESPONSE_287	BL1 /CL2	6.0	
117942	127	22:57:8.0	POINT_RESPONSE_280	IR4 /CL2	26.0	118086	130	5:41:48.0	POINT_RESPONSE_287	BL1 /CL2	6.0	
117943	127	23:15:5.0	POINT_RESPONSE_280	IR4 /CL2	26.0	118087	130	5:43:23.0	POINT_RESPONSE_287	BL1 /CL2	6.0	
117944	127	23:36:12.0	POINT_RESPONSE_280	IR4 /CL2	26.0	118088	130	5:45:51.0	POINT_RESPONSE_287	BL1 /CL2	6.0	
						118089	130	5:49:50.0	POINT_RESPONSE_287	BL1 /CL2	6.0	

118090	130	5:54:52.0	POINT_RESPONSE_287	BL1 /CL2	6.0	118885	135	8:27:18.0	POINT_RESPONSE_301	IR4 /CL2	-9.0
118091	130	6:4:16.0	POINT_RESPONSE_287	BL1 /CL2	6.0	118886	135	8:28:49.0	POINT_RESPONSE_301	IR4 /CL2	-9.0
118092	130	6:22:13.0	POINT_RESPONSE_287	BL1 /CL2	6.0	118887	135	8:30:23.0	POINT_RESPONSE_301	IR4 /CL2	-9.0
118093	130	6:29:29.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118888	135	8:32:52.0	POINT_RESPONSE_301	IR4 /CL2	-9.0
118094	130	6:30:40.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118889	135	8:35:55.0	POINT_RESPONSE_301	IR4 /CL2	-9.0
118095	130	6:32:4.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118890	135	8:41:4.0	POINT_RESPONSE_301	IR4 /CL2	-9.0
118097	130	6:36:18.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118893	135	9:44:35.0	POINT_RESPONSE_301	IR4 /CL2	-9.0
118098	130	6:40:25.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118894	135	10:2:33.0	POINT_RESPONSE_301	IR4 /CL2	-9.0
118099	130	6:49:50.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118895	135	10:20:30.0	POINT_RESPONSE_301	IR4 /CL2	-9.0
118100	130	6:59:15.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118897	135	10:48:43.0	POINT_RESPONSE_301	IR4 /CL2	-9.0
118101	130	7:17:14.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118898	135	10:58:10.0	POINT_RESPONSE_301	IR4 /CL2	-9.0
118102	130	7:35:11.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118899	135	11:19:17.0	POINT_RESPONSE_301	IR4 /CL2	-9.0
118103	130	7:56:16.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118988	135	17:27:35.0	POINT_RESPONSE_303	CL1 /CL2	-9.0
118104	130	8:1:28.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118989	135	17:31:14.0	POINT_RESPONSE_303	CL1 /CL2	-9.0
118105	130	8:22:32.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118990	135	17:33:56.0	POINT_RESPONSE_303	CL1 /CL2	-9.0
118106	130	8:43:38.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118991	135	17:36:35.0	POINT_RESPONSE_303	CL1 /CL2	-9.0
118107	130	9:4:45.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118993	135	17:42:36.0	POINT_RESPONSE_303	CL1 /CL2	-9.0
118108	130	9:19:2.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118994	135	17:45:7.0	POINT_RESPONSE_303	CL1 /CL2	-9.0
118109	130	9:29:1.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118995	135	17:47:35.0	POINT_RESPONSE_303	CL1 /CL2	-9.0
118110	130	9:37:53.0	POINT_RESPONSE_291	IRP0/MT3	6.0	118996	135	17:50:4.0	POINT_RESPONSE_303	CL1 /CL2	-9.0
118111	130	9:39:50.0	POINT_RESPONSE_291	IRP0/MT3	6.0	119003	135	18:8:12.0	POINT_RESPONSE_304	BL1 /CL2	-9.0
118112	130	9:44:5.0	POINT_RESPONSE_291	IRP0/MT3	6.0	119004	135	18:11:6.0	POINT_RESPONSE_304	BL1 /CL2	-9.0
118113	130	9:49:40.0	POINT_RESPONSE_291	IRP0/MT3	6.0	119005	135	18:21:20.0	POINT_RESPONSE_304	BL1 /CL2	-9.0
118114	130	9:52:52.0	POINT_RESPONSE_291	IRP0/MT3	6.0	119006	135	18:23:56.0	POINT_RESPONSE_304	BL1 /CL2	-9.0
118115	130	10:2:44.0	POINT_RESPONSE_291	IRP0/MT3	6.0	119007	135	18:28:6.0	POINT_RESPONSE_304	BL1 /CL2	-9.0
118532	131	18:8:16.0	POINT_RESPONSE_292	CL1 /CL2	6.0	119008	135	18:30:46.0	POINT_RESPONSE_304	BL1 /CL2	-9.0
118533	131	18:19:2.0	POINT_RESPONSE_292	CL1 /CL2	6.0	119009	135	18:33:4.0	POINT_RESPONSE_304	BL1 /CL2	-9.0
118534	131	18:25:11.0	POINT_RESPONSE_292	CL1 /CL2	6.0	119010	135	18:35:29.0	POINT_RESPONSE_304	BL1 /CL2	-9.0
118535	131	18:28:8.0	POINT_RESPONSE_292	CL1 /CL2	6.0	119017	135	18:51:23.0	POINT_RESPONSE_305	CL1 /IR3	-9.0
118536	131	18:30:35.0	POINT_RESPONSE_292	CL1 /CL2	6.0	119018	135	18:54:10.0	POINT_RESPONSE_305	CL1 /IR3	-9.0
118537	131	18:33:4.0	POINT_RESPONSE_292	CL1 /CL2	6.0	119019	135	19:0:17.0	POINT_RESPONSE_305	CL1 /IR3	-9.0
118538	131	18:35:26.0	POINT_RESPONSE_292	CL1 /CL2	6.0	119020	135	19:2:41.0	POINT_RESPONSE_305	CL1 /IR3	-9.0
118539	131	18:37:49.0	POINT_RESPONSE_292	CL1 /CL2	6.0	119021	135	19:5:0.0	POINT_RESPONSE_305	CL1 /IR3	-9.0
118547	131	19:5:13.0	POINT_RESPONSE_293	BL1 /CL2	6.0	119022	135	19:7:13.0	POINT_RESPONSE_305	CL1 /IR3	-9.0
118549	131	19:10:38.0	POINT_RESPONSE_293	BL1 /CL2	6.0	119023	135	19:9:27.0	POINT_RESPONSE_305	CL1 /IR3	-9.0
118550	131	19:13:36.0	POINT_RESPONSE_293	BL1 /CL2	6.0	119024	135	19:11:52.0	POINT_RESPONSE_305	CL1 /IR3	-9.0
118551	131	19:16:5.0	POINT_RESPONSE_293	BL1 /CL2	6.0	119025	135	19:19:18.0	POINT_RESPONSE_306	CL1 /CB3	-9.0
118553	131	19:21:16.0	POINT_RESPONSE_293	BL1 /CL2	6.0	119026	135	19:22:38.0	POINT_RESPONSE_306	CL1 /CB3	-9.0
118554	131	19:23:47.0	POINT_RESPONSE_293	BL1 /CL2	6.0	119027	135	19:24:56.0	POINT_RESPONSE_306	CL1 /CB3	-9.0
118555	131	19:26:26.0	POINT_RESPONSE_293	BL1 /CL2	6.0	119028	135	19:27:12.0	POINT_RESPONSE_306	CL1 /CB3	-9.0
118557	131	19:33:15.0	POINT_RESPONSE_294	CL1 /IR3	6.0	119030	135	19:31:16.0	POINT_RESPONSE_306	CL1 /CB3	-9.0
118558	131	19:37:14.0	POINT_RESPONSE_294	CL1 /IR3	6.0	119031	135	19:33:31.0	POINT_RESPONSE_306	CL1 /CB3	-9.0
118560	131	19:45:46.0	POINT_RESPONSE_294	CL1 /IR3	6.0	119032	135	19:35:55.0	POINT_RESPONSE_306	CL1 /CB3	-9.0
118562	131	19:52:27.0	POINT_RESPONSE_294	CL1 /IR3	6.0	119033	135	19:38:8.0	POINT_RESPONSE_306	CL1 /CB3	-9.0
118563	131	19:54:57.0	POINT_RESPONSE_294	CL1 /IR3	6.0	119034	135	19:41:14.0	POINT_RESPONSE_307	CL1 /MT1	-9.0
118564	131	19:57:38.0	POINT_RESPONSE_294	CL1 /IR3	6.0	119035	135	19:43:43.0	POINT_RESPONSE_307	CL1 /MT1	-9.0
118565	131	19:59:57.0	POINT_RESPONSE_294	CL1 /IR3	6.0	119036	135	19:57:7.0	POINT_RESPONSE_307	CL1 /MT1	-9.0
118566	131	20:2:29.0	POINT_RESPONSE_294	CL1 /IR3	6.0	119037	135	19:59:19.0	POINT_RESPONSE_307	CL1 /MT1	-9.0
118567	131	20:8:47.0	POINT_RESPONSE_295	CL1 /CB3	6.0	119038	135	20:1:36.0	POINT_RESPONSE_307	CL1 /MT1	-9.0
118568	131	20:12:38.0	POINT_RESPONSE_295	CL1 /CB3	6.0	119039	135	20:3:59.0	POINT_RESPONSE_307	CL1 /MT1	-9.0
118569	131	20:15:19.0	POINT_RESPONSE_295	CL1 /CB3	6.0	119040	135	20:6:12.0	POINT_RESPONSE_307	CL1 /MT1	-9.0
118570	131	20:17:42.0	POINT_RESPONSE_295	CL1 /CB3	6.0	119041	135	20:8:38.0	POINT_RESPONSE_307	CL1 /MT1	-9.0
118571	131	20:20:8.0	POINT_RESPONSE_295	CL1 /CB3	6.0	119042	135	20:11:48.0	POINT_RESPONSE_308	IRP0/CB3	-9.0
118572	131	20:22:30.0	POINT_RESPONSE_295	CL1 /CB3	6.0	119043	135	20:14:42.0	POINT_RESPONSE_308	IRP0/CB3	-9.0
118573	131	20:24:50.0	POINT_RESPONSE_295	CL1 /CB3	6.0	119044	135	20:19:18.0	POINT_RESPONSE_308	IRP0/CB3	-9.0
118574	131	20:27:12.0	POINT_RESPONSE_295	CL1 /CB3	6.0	119045	135	20:21:40.0	POINT_RESPONSE_308	IRP0/CB3	-9.0
118575	131	20:30:16.0	POINT_RESPONSE_296	CL1 /MT1	6.0	119046	135	20:29:1.0	POINT_RESPONSE_308	IRP0/CB3	-9.0
118576	131	20:40:3.0	POINT_RESPONSE_296	CL1 /MT1	6.0	119047	135	20:32:8.0	POINT_RESPONSE_308	IRP0/CB3	-9.0
118577	131	20:43:10.0	POINT_RESPONSE_296	CL1 /MT1	6.0	119048	135	20:34:21.0	POINT_RESPONSE_308	IRP0/CB3	-9.0
118578	131	20:45:48.0	POINT_RESPONSE_296	CL1 /MT1	6.0	119049	135	20:36:39.0	POINT_RESPONSE_308	IRP0/CB3	-9.0
118579	131	20:48:15.0	POINT_RESPONSE_296	CL1 /MT1	6.0						
118580	131	20:52:27.0	POINT_RESPONSE_296	CL1 /MT1	6.0						
118581	131	20:55:2.0	POINT_RESPONSE_296	CL1 /MT1	6.0						
118582	131	20:57:30.0	POINT_RESPONSE_296	CL1 /MT1	6.0						
118583	131	21:1:6.0	POINT_RESPONSE_297	IRP0/CB3	6.0						
118584	131	21:3:37.0	POINT_RESPONSE_297	IRP0/CB3	6.0						
118585	131	21:6:11.0	POINT_RESPONSE_297	IRP0/CB3	6.0						
118586	131	21:8:38.0	POINT_RESPONSE_297	IRP0/CB3	6.0						
118587	131	21:11:5.0	POINT_RESPONSE_297	IRP0/CB3	6.0						
118588	131	21:13:15.0	POINT_RESPONSE_297	IRP0/CB3	6.0						
118590	131	21:17:25.0	POINT_RESPONSE_297	IRP0/CB3	6.0						
118591	131	21:19:50.0	POINT_RESPONSE_297	IRP0/CB3	6.0						
118816	135	0:41:4.0	POINT_RESPONSE_299	CL1 /CL2	-9.0						
118817	135	0:42:33.0	POINT_RESPONSE_299	CL1 /CL2	-9.0						
118818	135	0:44:3.0	POINT_RESPONSE_299	CL1 /CL2	-9.0						
118819	135	0:45:32.0	POINT_RESPONSE_299	CL1 /CL2	-9.0						
118820	135	0:47:1.0	POINT_RESPONSE_299	CL1 /CL2	-9.0						
118821	135	0:48:30.0	POINT_RESPONSE_299	CL1 /CL2	-9.0						
118822	135	0:49:46.0	POINT_RESPONSE_299	CL1 /CL2	-9.0						
118823	135	0:51:26.0	POINT_RESPONSE_299	CL1 /CL2	-9.0						
118824	135	0:52:43.0	POINT_RESPONSE_299	CL1 /CL2	-9.0						
118825	135	0:54:17.0	POINT_RESPONSE_299	CL1 /CL2	-9.0						
118826	135	0:56:8.0	POINT_RESPONSE_299	CL1 /CL2	-9.0						
118837	135	1:51:11.0	POINT_RESPONSE_300	CL1 /MT3	-9.0						
118838	135	1:52:22.0	POINT_RESPONSE_300	CL1 /MT3	-9.0						
118839	135	1:54:2.0	POINT_RESPONSE_300	CL1 /MT3	-9.0						
118840	135	1:55:42.0	POINT_RESPONSE_300	CL1 /MT3	-9.0						
118841	135	1:57:47.0	POINT_RESPONSE_300	CL1 /MT3	-9.0						
118842	135	2:0:9.0	POINT_RESPONSE_300	CL1 /MT3	-9.0						
118843	135	2:4:13.0	POINT_RESPONSE_300	CL1 /MT3	-9.0						
118845	135	2:31:39.0	POINT_RESPONSE_300	CL1 /MT3	-9.0						
118846	135	2:49:36.0	POINT_RESPONSE_300	CL1 /MT3	-9.0						
118847	135	3:7:33.0	POINT_RESPONSE_300	CL1 /MT3	-9.0						
118848	135	3:25:31.0	POINT_RESPONSE_300	CL1 /MT3	-9.0						
118868	135	5:37:3.0	POINT_RESPONSE_302	IRP0/MT3	-9.0						
118869	135	5:38:13.0	POINT_RESPONSE_302	IRP0/MT3	-9.0						
118870	135	5:39:38.0	POINT_RESPONSE_302	IRP0/MT3	-9.0						
118871	135	5:41:12.0	POINT_RESPONSE_302	IRP0/MT3	-9.0						
118872	135	5:43:41.0	POINT_RESPONSE_302	IRP0/MT3	-9.0						
118873	135	5:47:48.0	POINT_RESPONSE_302	IRP0/MT3	-9.0						
118874	135	5:57:13.0	POINT_RESPONSE_302	IRP0/MT3	-9.0						
118876	135	6:24:48.0	POINT_RESPONSE_302	IRP0/MT3	-9.0						
118877	135	6:42:45.0	POINT_RESPONSE_302	IRP0/MT3	-9.0						
118879	135	7:9:11.0	POINT_RESPONSE_302	IRP0/MT3	-9.0						
118880	135	7:30:17.0	POINT_RESPONSE_302	IRP0/MT3	-9.0						
118882	135	8:12:40.0	POINT_RESPONSE_302	IRP0/MT3	-9.0						
118883	135	8:25:6.0	POINT_RESPONSE_301	IR4 /CL2	-9.0						
118884	135	8:26:8.0	POINT_RESPONSE_301	IR4 /CL2	-9.0						