Australian Government
Bureau of Meteorology

Report on the Quality of Land Surface Observations in Region V

July – December 2004

Report No. 16

WMC Melbourne
Lead Centre for Monitoring of the Quality of Land Surface Observation in RA-V

Data Management Section
Communications & Computing Systems Branch
Bureau of Meteorology, Australia

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1. Introduction

Within the Data Management Section of the Bureau of Meteorology lie responsibilities for collecting a full set of meteorological data in real-time from the WMO Global Observing System, and for making such data available to the Analysis-Prognosis models along with some indication as to reliability of report content.

Real-time judgement as to whether a reported element be assimilated by models relies largely on first guess fields, supplemented by observations from any neighbouring stations. Additionally, listings of platforms, which are currently considered suspect, are presented to the Analysis model.

To monitor platform performance, and also to expose likely positional errors, selected reported elements are paired with the interpolated first-guess value from the global model (6 hour forecast field) and analysed statistically each 6 months in a format which accords with the CBS recommended standards for the exchange of monitoring results. All observations used are unvalidated or "raw" data. This report covers a consolidated list of the suspect stations for the period July to December 2004. The locations of the suspect stations are shown in Figure1 and diagrams of the residuals for each of station are in Figures 2-5.

As part of WMO responsibilities as a WMC, copies of this report are made available to major GDPS Centres participating in data monitoring activities.

2. Monitoring Methods

The decision as to whether a station is ‘suspect’ is from determination of the deviations of Mean Sea Level Pressure (MSLP) from the GASP first-guess fields (Observation minus Guess), hereafter called O-G. Deviations are accessed relative to the first guess fields.

To achieve more complete reporting profiles for the investigation of suspect stations, observations were not retrieved for statistical analysis until 24 hours after real-time, thus not
all values used in such computations may have been available to the assimilation processing.

The selection criteria for deciding whether a station is suspect or not are as follows:

Number of observations (NOBS) >= 120, and one or more of the following:

1. the mean of O-G |BIAS| >= 3.0 hPa
2. the standard deviation of O-G SD >= 5.0 hPa
3. the percentage of gross errors PGE >= 25%

BIAS and SD are calculated excluding gross error data.

3 Monitoring Results

Table 1 contains a list of synoptic stations, which are considered to have reported suspect observations of mean sea level pressure (MSLP) during the 6 months.

WMO REGION 5

STN NO.	LAT	LONG	HT(M)	TIME	ELEM	NOBS	NGE	PGE	SD	BIAS	RMS
93419	-40.9	175.0	7	ALL	MSLP	192	100	52	1.1	-0.7	1.3
96947	-8.0	112.7	526	ALL	MSLP	162	0	0	1.5	3.8	4.0
97012	1.5	124.9	67	ALL	MSLP	487	6	1	1.6	-7.7	7.8
97378	-10.7	123.1	1	ALL	MSLP	258	202	78	3.7	-13.5	14.0

Table 1. List of land surface stations reporting suspect observations of mean sea level pressure over the period July to December 2004.

Table 2 details a Global coverage of synoptic stations, which are considered to have reported suspect observations of mean sea level pressure (MSLP) during the 6 months.

MONITORING OF SURFACE DATA

SUSPECT LIST

MONITORING CENTRE: MELBOURNE

JULY to DECEMBER 2004
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MONITORING PROCEDURES :-

PERIOD : SIX CALENDAR MONTHS

DATA MONITORED : REPORTS FROM EACH UNIQUE IDENTIFIER FOR SYNOP

AREA : FULL GLOBAL

STANDARD OF COMPARISON : +6H FIRST GUESS FIELD FROM THE AUSTRALIAN GLOBAL ASSIMILATION PREDICTION (GASP) MODEL

OBSERVATION TIMES : 00, 06, 12, 18 UTC

ELEMENT MONITORED : MSLP - MEAN SEA LEVEL PRESSURE (hPa)

PARAMETERS MONITORED :-

NOBS : NUMBER OF OBSERVATIONS RECEIVED (WITH FIRST GUESS AVAILABLE) EXCLUDING DUPLICATES

NGE : NUMBER OF OBSERVATIONS WITH GROSS ERRORS

PGE : PERCENTAGE OF OBSERVATIONS WITH GROSS ERRORS

SD : STANDARD DEVIATION OF DIFFERENCE BETWEEN OBSERVATIONS AND BACKGROUND FIELD EXCLUDING OBSERVATIONS WITH GROSS ERRORS

BIAS : MEAN OF DIFFERENCE BETWEEN OBSERVATIONS AND BACKGROUND FIELD EXCLUDING OBSERVATIONS WITH GROSS ERRORS

RMS : ROOT MEAN SQUARE OF DIFFERENCE BETWEEN
OBSERVATIONS AND BACKGROUND FIELD
EXCLUDING OBSERVATIONS WITH GROSS ERRORS

GROSS ERROR LIMIT : 15.0 hPa

SELECTION CRITERIA : NOBS >= 120 AND ONE OR MORE OF THE FOLLOWING:
1. |BIAS| >= 3.0hPa
2. SD >= 5.0hPa
3. PGE >= 25%

LIST OF SUSPECT LAND SURFACE STATIONS FOR JUL to DECEMBER 2004

WMO REGION 1

STN NO.	LAT	LONG	HT(M)	TIME	ELEM	NOBS	NGE	PGE	SD	BIAS	RMS
61492	16.1	-13.5	18	ALL	MSLP	341	0	0	1.7	4.2	4.5
62271	24.2	23.3	436	ALL	MSLP	272	0	0	1.4	3.4	3.7
62733	15.3	35.6	451	ALL	MSLP	224	1	0	2.6	3.2	4.2
62751	14.4	33.5	408	ALL	MSLP	216	0	0	2.4	3.1	4.0
62781	12.7	28.4	564	ALL	MSLP	192	0	0	2.7	3.3	4.3
62790	12.1	24.9	674	ALL	MSLP	181	0	0	2.4	3.5	4.2
62810	11.0	29.7	499	ALL	MSLP	120	0	0	2.7	4.7	5.5
62880	7.7	28.0	438	ALL	MSLP	122	1	1	2.5	4.3	5.0
64600	4.3	15.8	583	ALL	MSLP	157	0	0	1.7	3.1	3.5
64650	4.4	18.5	366	ALL	MSLP	211	1	0	1.9	4.0	4.4
64655	6.5	22.0	584	ALL	MSLP	134	0	0	2.0	4.2	4.6
64660	5.8	20.6	475	ALL	MSLP	194	0	0	1.7	3.5	3.9
64750	9.1	18.4	365	ALL	MSLP	530	0	0	2.4	3.1	3.9
64754	11.0	20.3	436	ALL	MSLP	235	0	0	2.5	4.7	5.3
65019	10.6	7.4	642	ALL	MSLP	143	0	0	1.6	3.9	4.2
65125	9.3	7.0	344	ALL	MSLP	166	0	0	2.0	5.3	5.6
65167	9.2	12.5	174	ALL	MSLP	146	0	0	2.0	4.7	5.1
65416	9.0	-2.5	301	ALL	MSLP	330	0	0	1.3	3.2	3.5
65418	9.5	-0.9	173	ALL	MSLP	282	0	0	1.2	4.2	4.4
67241	-15.0	40.7	11	ALL	MSLP	230	1	0	0.9	-3.5	3.7
68903	-37.0	-12.3	51	ALL	MSLP	441	185	42	6.6	4.1	7.7

WMO REGION 2

STN NO.	LAT	LONG	HT(M)	TIME	ELEM	NOBS	NGE	PGE	SD	BIAS	RMS
24671	64.0	135.9	402	ALL	MSLP	692	1	0	4.2	3.3	5.3
24688	63.3	143.1	741	ALL	MSLP	723	89	12	5.2	2.9	6.0
38933	37.8	68.8	429	ALL	MSLP	374	4	1	2.5	6.5	7.0
40700	39.7	48.1	45	ALL	MSLP	681	0	0	1.4	-3.8	4.1
40726	36.8	45.7	1385	ALL	MSLP	641	0	0	2.6	4.4	5.1
40741	36.5	61.2	236	ALL	MSLP	672	1	0	1.7	-4.0	4.3
40836	30.8	51.7	1880	ALL	MSLP	675	0	0	2.4	3.8	4.5
44203	51.1	99.7	1583	ALL	MSLP	687	94	14	4.8	4.1	6.3
44207	50.4	100.2	1687	ALL	MSLP	690	17	2	4.5	4.1	6.1
44212	49.8	92.1	936	ALL	MSLP	698	44	6	4.8	4.1	6.3
44213	49.7	94.4	1232	ALL	MSLP	703	37	5	4.9	3.6	6.1
44218	48.0	91.7	1406	ALL	MSLP	694	26	4	5.1	1.7	5.3
44224	48.8	90.1	1928	ALL	MSLP	678	115	17	6.2	2.0	6.5
44225	48.7	98.3	1723	ALL	MSLP	703	97	14	4.9	4.6	6.8
44230	49.6	102.0	1236	ALL	MSLP	692	7	1	3.4	4.9	5.9
44232	49.4	102.7	933	ALL	MSLP	716	3	0	3.7	4.1	5.6
44272	47.8	96.8	1753	ALL	MSLP	697	11	2	5.1	0.1	5.1
44275	46.8	98.1	2255	ALL	MSLP	696	33	5	5.4	2.8	6.1
44277	46.4	96.3	2147	ALL	MSLP	700	8	1	5.1	0.0	5.1
44284	46.7	100.1	2117	ALL	MSLP	703	75	11	4.8	5.2	7.1
44285	46.9	102.8	1655	ALL	MSLP	700	6	1	4.5	3.9	6.0
44329	44.6	98.7	2103	ALL	MSLP	200	1	1	4.1	3.6	5.4
44336	45.5	103.9	1316	ALL	MSLP	651	3	0	3.6	3.7	5.1
48952	15.7	106.4	168	ALL	MSLP	271	0	0	1.7	-3.4	3.8
48957	14.8	106.8	105	ALL	MSLP	131	0	0	1.4	3.2	3.5
51334	44.6	82.9	321	ALL	MSLP	723	0	0	2.7	3.2	4.2

51818	37.6	78.3	1376	ALL	MSLP	724	0	0	3.5	3.1	4.7
52495	40.8	104.5	1329	ALL	MSLP	734	0	0	2.2	3.6	4.2
53192	44.0	114.9	1128	ALL	MSLP	734	0	0	2.2	3.5	4.1
53352	41.7	110.4	1377	ALL	MSLP	727	0	0	2.2	3.9	4.5
53480	41.0	113.1	1416	ALL	MSLP	721	0	0	1.9	3.2	3.7
56287	30.0	103.0	629	ALL	MSLP	736	0	0	1.6	3.5	3.9

WMO REGION 3

STN NO.	LAT	LONG	HT(M)	TIME	ELEM	NOBS	NGE	PGE	SD	BIAS	RMS
80398	-4.2	-69.9	84	ALL	MSLP	204	1	0	1.3	5.6	5.7
82212	-2.5	-66.2	55	ALL	MSLP	511	4	1	2.3	4.3	4.9
82287	-2.9	-41.6	22	ALL	MSLP	537	0	0	0.7	-3.7	3.7
82353	-3.2	-52.2	74	ALL	MSLP	525	0	0	1.2	-3.8	4.0
82425	-4.1	-63.1	46	ALL	MSLP	394	0	0	1.4	3.6	3.9
82586	-5.2	-39.3	212	ALL	MSLP	534	0	0	1.4	-4.2	4.4
82765	-7.3	-47.5	193	ALL	MSLP	536	0	0	1.7	3.3	3.7
83264	-12.2	-56.5	415	ALL	MSLP	465	1	0	1.1	5.3	5.4
83270	-13.5	-52.5	430	ALL	MSLP	280	0	0	1.6	4.1	4.4
83319	-14.7	-52.3	315	ALL	MSLP	523	2	0	1.3	4.8	5.0
83726	-22.0	-47.9	856	ALL	MSLP	533	0	0	1.6	3.3	3.7
84377	-3.8	-73.3	126	ALL	MSLP	546	0	0	1.4	4.0	4.3
84401	-5.2	-80.6	55	ALL	MSLP	541	0	0	1.3	5.5	5.6
84452	-6.8	-79.8	34	ALL	MSLP	536	0	0	1.7	5.0	5.3
84455	-6.4	-76.4	282	ALL	MSLP	417	6	1	2.0	10.0	10.2
84501	-8.1	-79.0	30	ALL	MSLP	421	1	0	1.7	5.9	6.1
84628	-12.0	-77.1	13	ALL	MSLP	561	0	0	1.5	3.3	3.6
84720	-14.9	-74.9	567	ALL	MSLP	249	2	1	1.6	6.0	6.2
84782	-18.1	-70.3	458	ALL	MSLP	446	0	0	1.9	4.4	4.8
85041	-11.0	-68.8	235	ALL	MSLP	315	0	0	2.0	6.8	7.1
85210	-16.3	-58.4	124	ALL	MSLP	314	0	0	1.4	3.4	3.7
85365	-22.0	-63.7	645	ALL	MSLP	309	0	0	3.3	3.2	4.6
85394	-22.8	-64.3	381	ALL	MSLP	251	0	0	3.5	3.6	5.0
85406	-18.4	-70.3	55	ALL	MSLP	716	1	0	2.2	4.8	5.2
85418	-20.5	-70.2	48	ALL	MSLP	724	0	0	1.6	3.0	3.4
87222	-28.6	-65.8	454	ALL	MSLP	722	0	0	2.5	-3.2	4.0

WMO REGION 4

STN NO.	LAT	LONG	HT(M)	TIME	ELEM	NOBS	NGE	PGE	SD	BIAS	RMS
71023	65.9	-89.4	18	ALL	MSLP	736	163	22	7.4	1.5	7.6
71048	61.6	-125.8	610	ALL	MSLP	376	0	0	1.5	4.0	4.3
71060	52.5	-116.1	1362	ALL	MSLP	695	64	9	6.0	0.2	6.0
72375	35.1	-11.2	2139	ALL	MSLP	722	24	3	5.8	-1.9	6.1
72376	36.2	-111.8	2181	ALL	MSLP	719	1	0	4.1	4.4	6.0
72462	37.4	-105.9	2299	ALL	MSLP	723	3	0	4.2	5.5	6.9
72475	38.4	-113.0	1536	ALL	MSLP	723	0	0	3.4	3.2	4.7
72486	39.3	-114.8	1909	ALL	MSLP	721	1	0	3.5	3.0	4.7
72570	40.5	-107.5	1915	ALL	MSLP	727	1	0	3.4	5.7	6.7
72578	42.9	-112.6	1365	ALL	MSLP	722	0	0	3.3	3.8	5.0
76061	31.3	-113.6	48	ALL	MSLP	172	0	0	1.4	3.2	3.5
76220	29.0	-107.8	1932	ALL	MSLP	217	26	12	3.0	9.9	10.4
76323	26.9	-105.7	1661	ALL	MSLP	450	1	0	3.4	5.7	6.6
76373	25.4	-105.8	1967	ALL	MSLP	267	0	0	4.6	3.5	5.8
76625	20.6	-100.4	1880	ALL	MSLP	180	0	0	2.4	-4.6	5.1
76634	20.1	-98.4	2181	ALL	MSLP	238	0	0	2.6	4.4	5.1
76658	19.2	-103.7	494	ALL	MSLP	168	0	0	1.2	4.7	4.9
76687	19.5	-96.9	1389	ALL	MSLP	522	0	0	1.4	5.4	5.6
76762	17.5	-99.5	1265	ALL	MSLP	373	0	0	1.7	4.3	4.6
76848	16.3	-92.1	1646	ALL	MSLP	403	0	0	1.4	-3.9	4.1
78090	25.4	-76.7	10000	ALL	MSLP	246	5	2	6.0	-2.5	6.5
78588	17.2	-87.5	1	ALL	MSLP	686	686	100	**	**	**

WMO REGION 5

STN NO.	LAT	LONG	HT(M)	TIME	ELEM	NOBS	NGE	PGE	SD	BIAS	RMS
93419	-40.9	175.0	7	ALL	MSLP	192	100	52	1.1	-0.7	1.3
96947	-8.0	112.7	526	ALL	MSLP	162	0	0	1.5	3.8	4.0
97012	1.5	124.9	67	ALL	MSLP	487	6	1	1.6	-7.7	7.8

97378	-10.7	123.1	1	ALL	MSLP	258	202	78	3.7	-13.5	14.0

WMO REGION ANTARCTICA

STN NO.	LAT	LONG	HT(M)	TIME	ELEM	NOBS	NGE	PGE	SD	BIAS	RMS
89263	-66.0	-66.1	20	ALL	MSLP	723	196	27	2.6	11.8	12.1
89512	-70.8	11.8	102	ALL	MSLP	730	9	1	3.1	-3.6	4.8
89514	-70.8	11.7	117	ALL	MSLP	680	18	3	3.1	-4.2	5.2

Figure 1

SUSPECT STATIONS FOR LAND SURFACE OBSERVATIONS FOR MSLP in RA-V

JULY to DECEMBER 2004

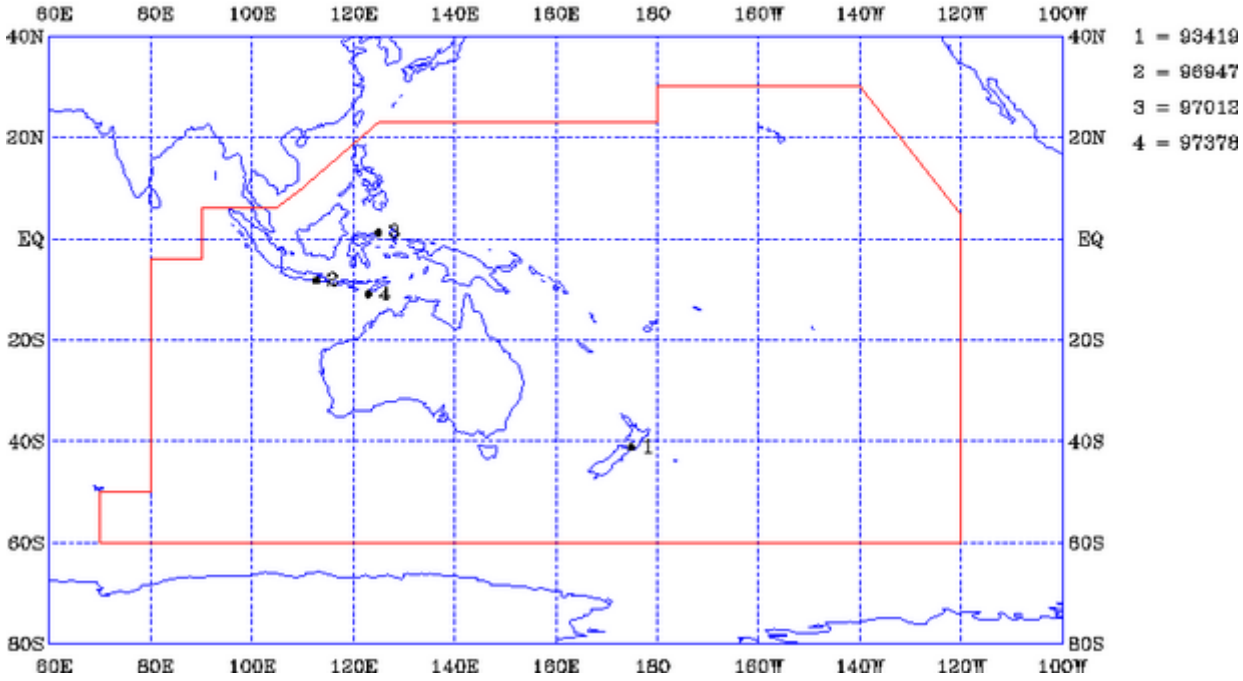

Figure 2
Residuals of MSL Pressure
July – December 2004
STATION: ***93419*** PARA PARAUMU TEST AWS

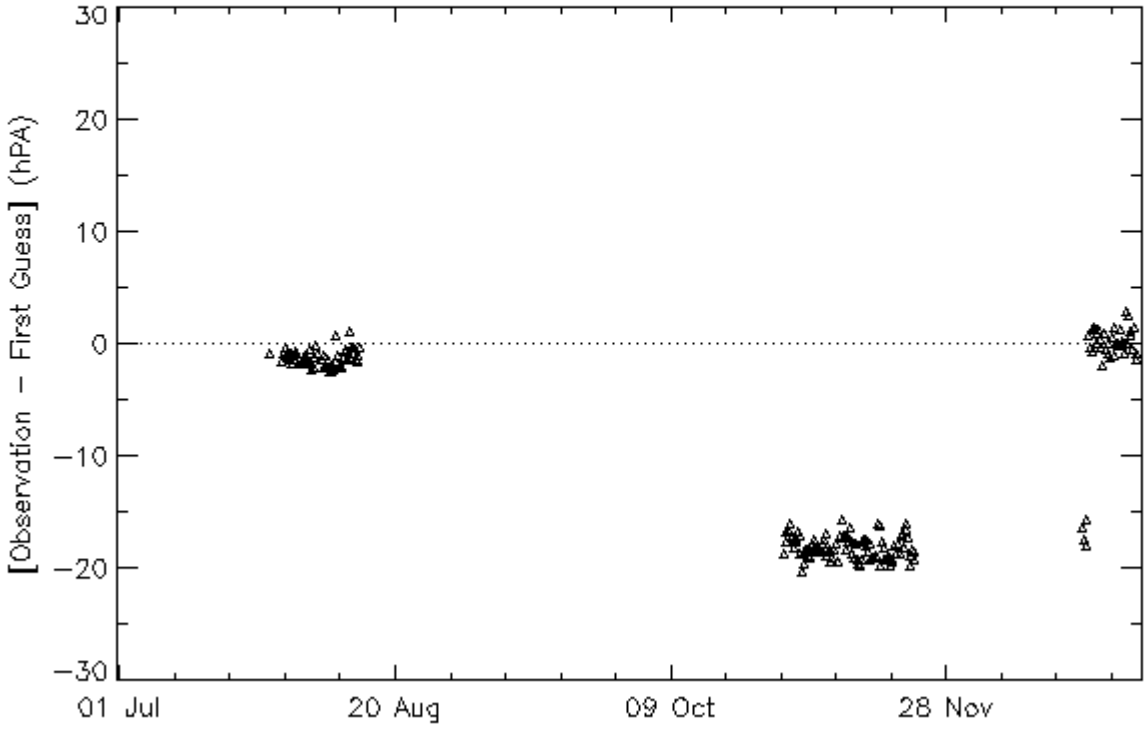

Figure 3
Residuals of MSL Pressure
July – December 2004
STATION: ***96947*** MALANG/ABDUL RAHKMAN

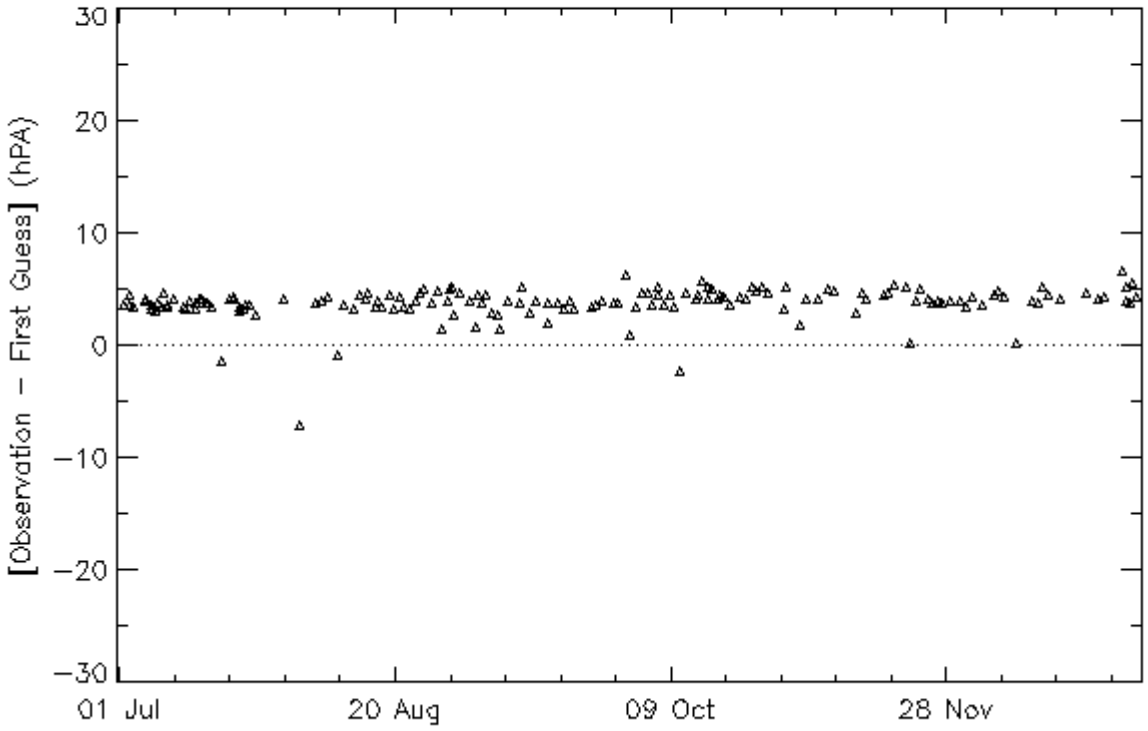

Figure 4
Residuals of MSL Pressure
July – December 2004
STATION: ***97012*** KAYU WATU MANADO

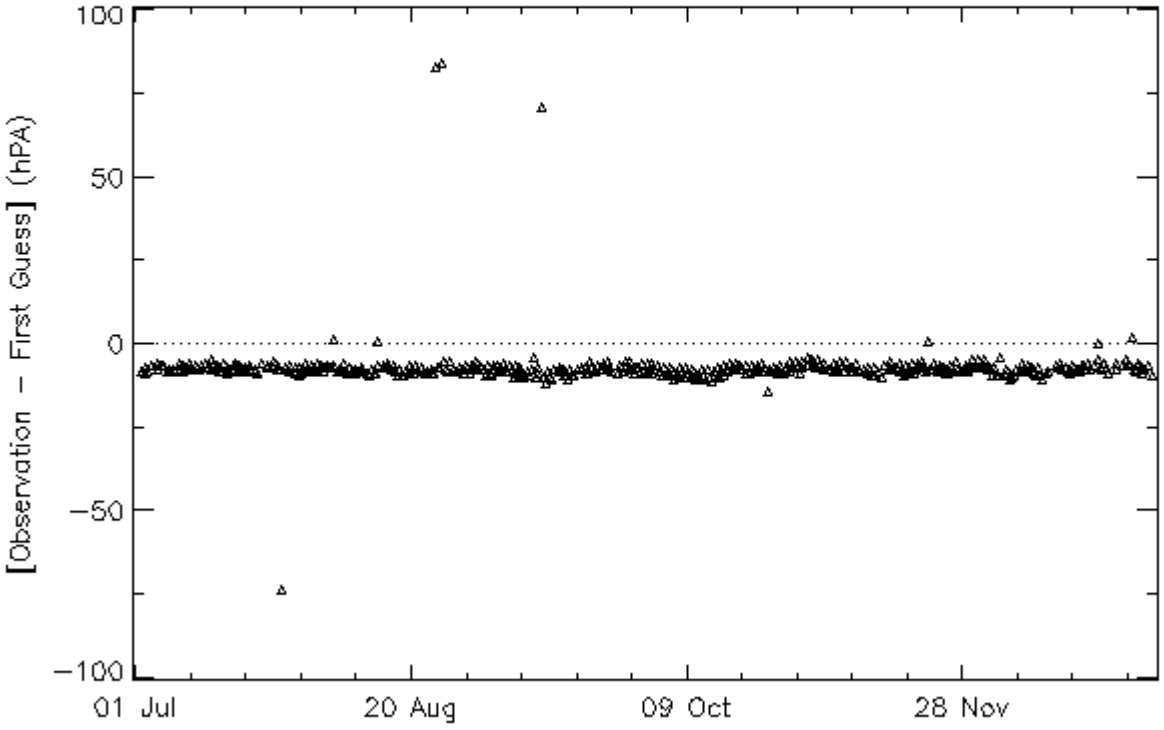

Figure 5
Residuals of MSL Pressure
July – December 2004
STATION: ***97378*** ROTE/BAA