Report on the Quality of Land Surface Observations in Region II (Asia)

July – December 2025

No. 70

March 2026

RSMC Tokyo
Lead Center for Monitoring Quality of Land Surface Observations

Japan Meteorological Agency
3-6-9 Toranomon, Minato City, Tokyo 105-8431
Japan

Report on the Quality of Land Surface Observations in Region II
(No. 70)
July – December 2025

Summary

In its role as a Lead Center, RSMC Tokyo has issued the 70th report on the land surface observation quality monitoring for the period from July to December 2025. The report includes a consolidated list of stations suspected of producing low-quality observation data.

（1）SLP

As a result of monitoring, five stations (41171, 41175, 41177, 48963, 48973) were excluded from the consolidated lists of the previous report (January – June 2025), and three stations (38403, 38827, 48018) were newly added to the lists.

（2）MSLP

As a result of monitoring, seven stations (41171, 41175, 41177, 48961, 42849, 48963, 48973) were excluded from the consolidated lists of the previous report (January – June 2025), and three stations (23992, 38403, 48925) were newly added to the lists.

（3）GZ

As a result of monitoring, one station (41249) was excluded from the consolidated lists of the previous report (January – June 2025), and one station (38827) was newly added to the lists.

1. Introduction

Pursuant to Paragraph 22 of Attachment II.7 of the Manual on the Global Data Processing and Forecasting System (WMO No. 485), the Regional Specialized Meteorological Center (RSMC) Tokyo was designated by the President of the Commission for Basic Systems (CBS) as a Lead Center for monitoring the quality of land surface observations (i.e., SYNOP) in Region II in March 1991. The Center is responsible for monitoring the quality of land surface observations and maintaining consolidated lists of stations suspected of reporting low-quality observation data together with adequate evidence. The lists are to be passed on to the WMO Secretariat and monitoring centers participating in this activity as well as to Members of Regional Association (RA) II for their reference.

2. Monitored Data

Monitored surface observation data are obtained at 00, 06, 12 and 18 UTC and collected at RSMC Tokyo before the data cut-off time, defined as the end of the period in which observation data are gathered for operational analysis. The cut-off times for Japan Meteorological Agency (JMA) global analysis are shown in Table 1.

Table 1 Data cut-off times for JMA global analysis.

Analysis time	Data cut-off time
00 UTC	11:50 UTC
06 UTC	13:50 UTC
12 UTC	23:50 UTC
18 UTC	01:50 UTC

The observation elements monitored are (1) station level pressure, (2) mean sea level pressure and (3) geopotential height, hereafter referred to as SLP, MSLP and GZ, respectively. In accordance with the Manual on Codes (WMO No. 306) Volume II, GZ data on an agreed standard pressure level are reported at the stations whose elevation is higher than 800 m. Standard pressure levels defined in line with station elevation are shown in Table 2.

Table 2 Elevation of stations reporting GZ data and corresponding standard pressure levels.

Station elevation (m)	Pressure level (hPa)
800 - 2,300	850
2,300 - 3,700	700
Higher than 3,700	500

The numbers of stations reporting SLP, MSLP and/or GZ data in Region II are shown in Table 3, and the locations of these land surface stations are shown in Figure 1.

Table 3 Numbers of stations reporting SLP, MSLP and/or GZ data in Region II

Element	Number of stations
SLP	1946
MSLP	2026
GZ	98

3. Monitoring Methods

The three items described below are examined for each element.

(i) Monthly statistics on observation deviations from the most recent forecast of JMA ' s global model (referred to as first-guess values) (observation minus guess, hereafter referred to as O-G) and on related trends over the monitoring period

(ii) Monthly statistics on deviations from values observed at surrounding stations

(iii) Reference information from other monitoring centers

Information on the latitude, longitude and altitude of each station is necessary for calculation of first-guess values. Such data for land surface station locations is retrieved from the surface-based observing

system component of the Observing Systems Capability Analysis and Review Tool (OSCAR/Surface)* , replacing WMO No. 9, Volume A.

The monitoring procedure has two steps as outlined below.

(1) Exclusion of data with gross errors from the statistical calculation sample

The following thresholds are applied for the gross error check in the first step:

|O-G| >= 15 hPa for SLP and MSLP
|O-G| >= 100 gpm for GZ

Gross error data are excluded from the calculation of BIAS (the mean of O-G) and SD (the standard deviation of O-G).

(2) Identification of suspect stations

When the total number of observations (NOBS) is 184 or more, the next criteria are applied:

- BIAS	|BIAS| >= 3 hPa for SLP and MSLP
	|BIAS| >= 30 gpm for GZ
- SD	SD >= 5 hPa for SLP and MSLP
	SD >= 40 gpm for GZ
- Percentage of gross errors (PGE)	PGE >= 25%

Stations with even one statistic exceeding the threshold are considered suspect.

Note:

(i) The quality of observation data from stations is not checked when the NOBS value is less than 184 or the difference between the station elevation and the model elevation is greater than 1,000 m. MSLP reports are also not checked for stations located at altitudes higher than 1,000 m above sea level.

(ii) In case of low quality of the first-guess field, those statistics can exceed the threshold and the stations are listed in the consolidated list. To avoid such situations, statistics of surrounding stations and information from other monitoring centers are also used to judge whether the quality of the station's first-guess field value is appropriate.

*https://oscar.wmo.int/surface/index.html#/

4. Monitoring Results

4.1 Consolidated list of suspect stations throughout the period

Table 4 List of suspect land surface stations during the period from July to December 2025

WMO IDENT	LAT (N)	LON (E)	H (m)	HM (m)	ELEM	NOBS	PGE (%)	SD	BIAS	RMS
30673	53.8	119.7	625	747	SLP	736	0	0.9	-8.5	8.5
					MSLP	736	0	1.3	0.2	1.3
35615	47.6	53.3	-21	-16	SLP	726	0	0.4	0.2	0.4
					MSLP	726	0	0.5	5.2	5.2
35701	47.2	51.0	-27	-24	SLP	714	0	0.4	0.0	0.4
					MSLP	714	0	0.5	6.4	6.4
38262	43.0	59.8	93	64	SLP	736	0	0.7	3.3	3.4
					MSLP	736	0	0.7	0.1	0.7
38567	40.1	65.4	340	407	SLP	734	0	1.0	-6.8	6.9
					MSLP	734	0	1.2	-6.9	7.0
38836	38.6	68.7	800	1034	SLP	726	0	1.0	-3.2	3.4
					MSLP	724	1	1.6	-4.2	4.5
38875	39.0	73.6	3930	4259	SLP	359	100	*****	*****	*****
					-	-	-	-	-	-
38880	38.0	58.4	312	199	SLP	736	1	1.0	11.7	11.7
					MSLP	736	0	0.8	0.1	0.8
38944	37.5	69.4	447	622	SLP	733	0	1.1	-5.5	5.6
					MSLP	733	0	1.3	-5.6	5.7
41315	17.3	54.1	881	641	SLP	733	98	0.3	14.7	14.7
					GZ850	692	85	52.4	6.5	52.8
41573	33.9	73.4	2127	1411	SLP	733	0	1.3	8.8	8.9
					GZ850	732	0	12.3	-1.6	12.4
41710	28.8	62.8	683	685	SLP	726	0	1.0	-2.2	2.4
					MSLP	726	0	1.4	-3.5	3.8
41757	25.1	62.3	96	-6	SLP	732	0	0.8	8.2	8.2
					MSLP	732	0	0.7	0.4	0.8
42045	33.5	75.2	1630	2356	SLP	552	0	1.5	-5.7	5.9
					GZ850	552	0	14.5	-59.8	61.5
42056	32.7	74.8	323	295	SLP	731	0	0.6	-6.5	6.5
					-	-	-	-	-	-
42083	31.1	77.2	2202	1552	SLP	359	91	0.4	14.8	14.8
					-	-	-	-	-	-
42111	30.3	78.1	683	851	SLP	731	0	0.7	6.0	6.0
					MSLP	732	0	1.4	-1.3	1.9
42114	30.4	78.4	770	1482	SLP	366	100	*****	*****	*****
					-	-	-	-	-	-
42147	29.5	79.7	2311	1687	SLP	367	0	0.7	3.9	4.0

WMO IDENT	LAT (N)	LON (E)	H (m)	HM (m)	ELEM	NOBS	PGE (%)	SD	BIAS	RMS
					-	-	-	-	-	-
42299	27.3	88.6	1756	1964	SLP	368	0	0.6	0.4	0.7
					GZ850	368	0	8.8	56.6	57.3
44406	29.3	80.9	617	1459	SLP	448	0	1.7	4.3	4.6
					MSLP	448	0	3.0	-2.8	4.1
47020	41.0	126.6	306	677	SLP	736	0	1.5	0.3	1.5
					MSLP	736	1	2.7	10.1	10.5
47037	40.0	125.3	99	217	SLP	736	0	1.4	-4.2	4.4
					MSLP	736	0	1.4	-4.1	4.3
48001	27.3	97.4	434	555	SLP	528	34	1.6	0.6	1.7
					MSLP	528	0	1.8	-0.9	2.0
48043	22.0	96.5	1078	946	GZ850	336	100	*****	*****	*****
					-	-	-	-	-	-
48921	21.6	101.9	1360	1049	SLP	514	1	0.9	-4.5	4.6
					GZ850	510	100	0.0	92.8	92.8
48925	20.7	102.0	636	960	SLP	518	0	1.0	-5.1	5.2
					MSLP	516	0	1.2	-3.6	3.8
48935	19.5	103.1	1094	1204	SLP	522	1	0.9	0.1	0.9
					GZ850	519	12	11.6	-87.4	88.2
48944	18.3	102.6	185	226	SLP	392	99	0.4	4.2	4.2
					MSLP	392	0	3.4	-7.0	7.8
48952	15.7	106.4	180	288	SLP	521	0	1.3	3.3	3.5
					MSLP	520	0	1.2	2.0	2.3

WMO IDENT:	WMO station identification number
LAT:	station latitude
LON:	station longitude
H:	barometer elevation
HM:	model elevation
ELEM:	observed element
NOBS:	total number of observations during the period
PGE:	percentage of gross errors
SD:	standard deviation of (observation - guess)
BIAS:	bias of (observation - guess)
RMS:	root mean square of (observation - guess)

RUSSIAN FEDERATION IN ASIA

30673 - Negative bias of O-G at the station level (Figures 2 and 3)

KAZAKHSTAN

35615 - Positive bias of O-G at the mean sea level (Figures 4 and 5)

35701 - Positive bias of O-G at the mean sea level (Figures 4 and 6)

UZBEKISTAN

38262 - Positive bias of O-G at the station level (Figures 7 and 8)

38567 - Negative bias of O-G at the station level and at the mean sea level (Figures 9, 10 and 11)

TAJIKISTAN

38836 - Negative bias of O-G at the mean sea level (Figures 10 and 12)

38875 - Positive bias of O-G at the station level (Figure 13)

38944 - Negative bias of O-G at the station level and at the mean sea level (Figures 9, 10 and 15)

TURKMENISTAN

38880 - Positive bias of O-G at the station level (Figures 7 and 14)

OMAN

41315 - Positive bias of O-G at the station level and negative bias of O-G at 850 hPa or 700 hPa (Figures 16 and 17)

PAKISTAN

41573 - Positive bias of O-G at the station level (Figures 18 and 19)

41710 - Negative bias of O-G at the mean sea level (Figures 20 and 21)

41757 - Positive bias of O-G at the station level (Figures 22 and 23)

INDIA

42045 - Negative bias of O-G at the station level and at 850 hPa (Figures 18, 24 and 25)

42056 - Negative bias of O-G at the station level (Figures 18 and 26)

42083 - Positive bias of O-G at the station level (Figures 18 and 27)

42111 - Positive bias of O-G at the station level (Figures 18 and 28)

42114 - Negative bias of O-G at the station level (Figure 29)

42147 - Positive bias of O-G at the station level (Figures 18 and 30)

42299 - Positive bias of O-G at 850 hPa (Figures 31 and 32)

NEPAL

44406 - Positive bias of O-G at the station level (Figures 18 and 33)

KOREA, DEMOCRATIC PEOPLE'S REPUBLIC OF

47020 - Positive bias of O-G at the mean sea level (Figures 34 and 35)

47037 - Negative bias of O-G at the station level and at the mean sea level (Figures 34, 36 and 37)

MYANMAR

48001 - Intermittent positive bias of O-G at the station level (Figure 38)

48043 - Negative bias of O-G at 850 hPa (Figure 39)

LAO PEOPLE'S DEMOCRATIC REPUBLIC

48921 - Negative bias of O-G at the station level and at 850 hPa (Figures 40 and 42)

48925 - Negative bias of O-G at the station level (Figures 40 and 43)

48935 - Negative bias of O-G at 850 hPa (Figures 41 and 44)

48944 - Negative bias of O-G at the station level and at the mean sea level (Figures 45 and 46)

48952 - Positive bias of O-G at the station level (Figures 40 and 47)

4.2 Stations where quality deteriorated during the period

Table 5 List of suspect land surface stations where quality deteriorated during the period

WMO IDENT	LAT (N)	LON (E)	H (m)	HM (m)	ELEM	NOBS	PGE (%)	SD	BIAS	RMS
23992	60.7	97.5	178	348	SLP	606	0	0.9	0.1	0.9
					MSLP	606	1	5.9	4.8	7.6
38403	41.8	62.5	97	131	SLP	735	4	3.9	7.1	8.1
					MSLP	736	5	3.9	7.1	8.1
38827	38.2	67.2	1245	1421	SLP	732	1	7.1	-6.7	9.8
					GZ850	731	52	57.4	-11.8	58.6
48018	24.2	96.3	95	204	SLP	456	0	1.3	3.3	3.5
					MSLP	454	0	1.0	-0.8	1.3
48925	20.7	102.0	636	960	SLP	518	0	1.0	-5.1	5.2
					MSLP	516	0	1.2	-3.6	3.8

RUSSIAN FEDERATION IN ASIA

23992 - Intermittent positive bias of O-G at the mean sea level (Figures 48 and 49)

The intermittent positive bias of O-G at the mean sea level appears to have been observed since August 2025.

UZBEKISTAN

38403 - Positive bias of O-G at the station level and at the mean sea level (Figures 9, 10 and 50)

The positive bias of O-G at the station level and at the mean sea level appears to have been observed since September 2025.

38827 - O-G at the station level and at 850 hPa has been fluctuating wildly . (Figures 9 and 51)

MYANMAR

48018 - Positive bias of O-G at the station level (Figures 52 and 53)

LAO PEOPLE'S DEMOCRATIC REPUBLIC

48925 - Negative bias of O-G at the mean sea level (Figures 45 and 54)

4.3 Stations improved and excluded from the previous consolidated list

QATAR

41171 - Improved at the station level and at the mean sea level (Figure 55)

41175 - Improved at the station level and at the mean sea level (Figure 56)

41177 - Improved at the station level and at the mean sea level (Figure 57)

CAMBODIA

48961 - Improved at the mean sea level (Figure 58)

4.4 Stations removed from the previous consolidated list

OMAN

41249 - No reports during the period

INDIA

42849 - Although station 42849 still displays positive biases of O-G at the mean sea level, it was removed from the consolidated list because the number of reports (183) was insufficient for quality checking. (Figure 59)

CAMBODIA

48963 - Although station 48963 still displays positive biases of O-G at the station level and at the mean sea level, it was removed from the consolidated list because the number of reports (135) was insufficient for quality checking. (Figure 60)

48973 - Although station 48973 still displays positive biases of O-G at the station level and at the mean sea level, it was removed from the consolidated list because the number of reports (140) was insufficient for quality checking. (Figure 61)

5. Possible Causes of Remarkable and Sustained Biases

The following are possible causes of remarkable and sustained biases

(i) The barometer used for observation is not correctly calibrated.

(ii) The latitude, longitude or altitude of the station in OSCAR/Surface has not been updated in a timely and appropriate manner. This could result in remarkable biases because it may cause incorrect calculated first-guess field values.

(iii) Biases are specific to the NWP model used in quality monitoring.

Note: Model biases are likely to appear in relatively large areas.

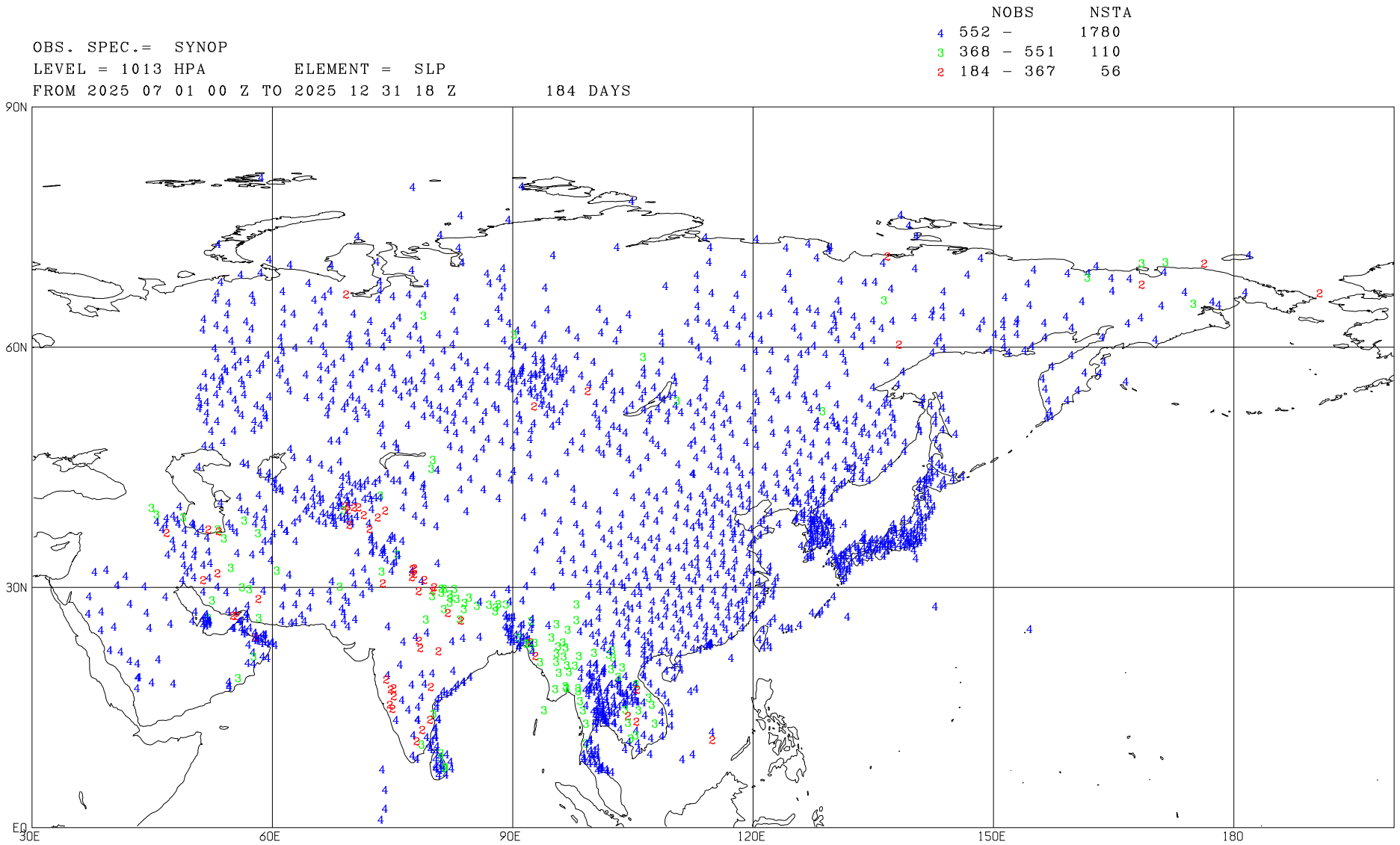

Figure 1(a) Location of all land surface stations reporting station level pressure (SLP) observations in Region II over the six-month period from July to December 2025. Numbers (2, 3, 4) show the total number of observations (NOBS) received at RSMC Tokyo. The total numbers of stations (NSTA) reporting SLP are shown at the top of the figure.

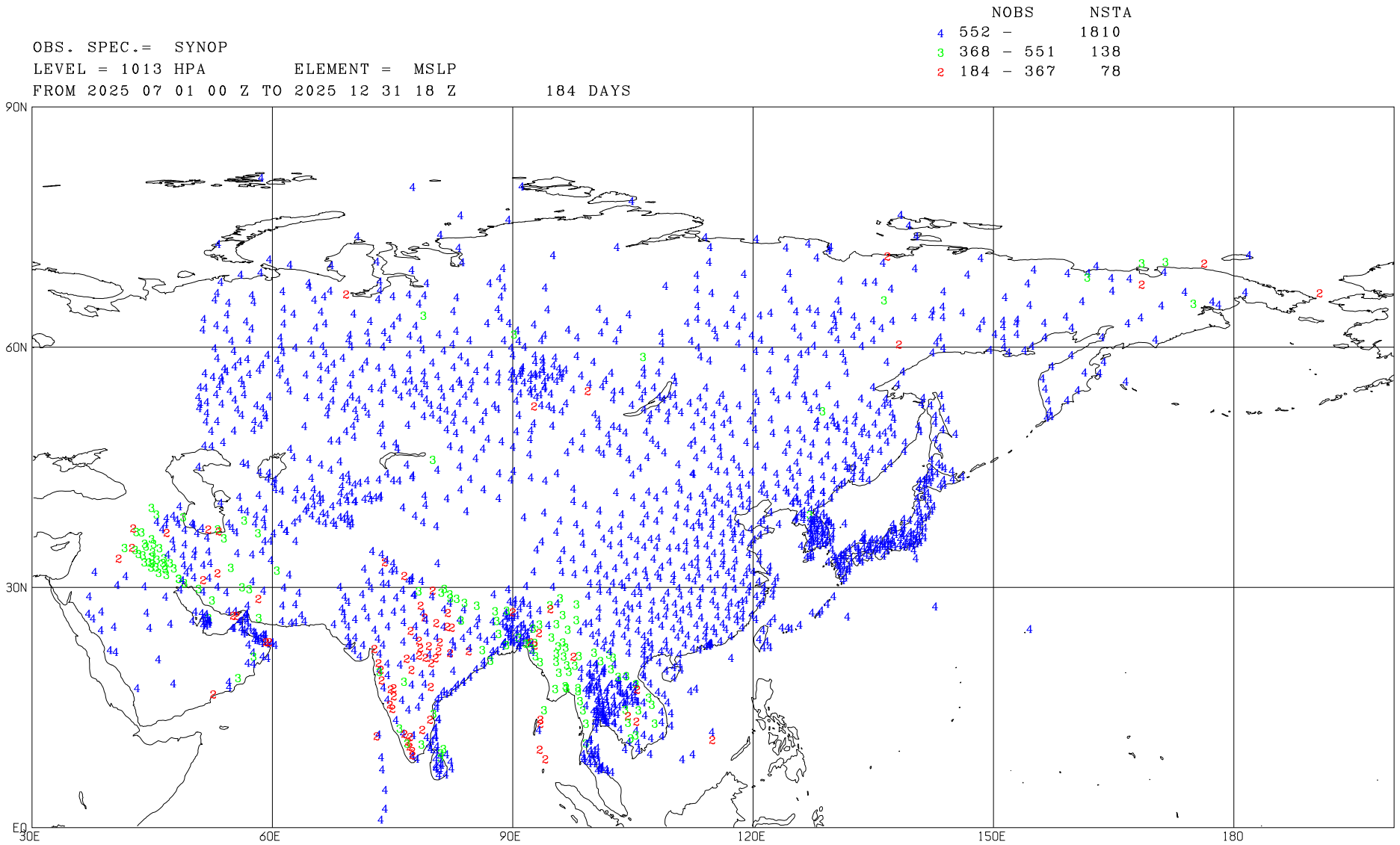

Figure 1(b) Location of all land surface stations reporting mean sea level pressure (MSLP) observations in Region II over the six-month period from July to December 2025. Numbers (2, 3, 4) show the total number of observations (NOBS) received at RSMC Tokyo. The total numbers of stations (NSTA) reporting MSLP are shown at the top of the figure.

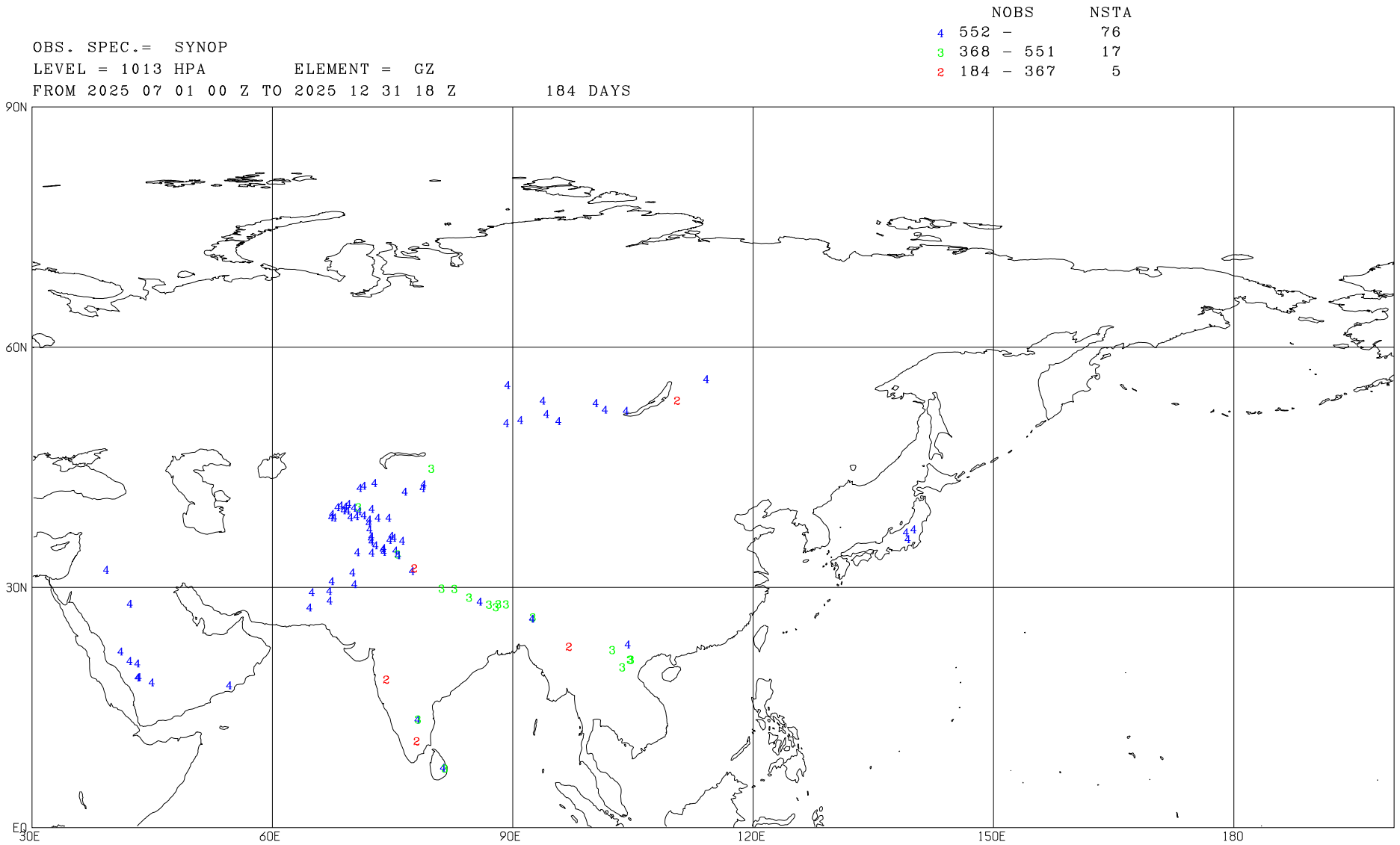

Figure 1(c) Location of all land surface stations reporting geopotential height (GZ) observations in Region II over the six-month period from July to December 2025. Numbers (2, 3, 4) show the total number of observations (NOBS) received at RSMC Tokyo. The total numbers of stations (NSTA) reporting GZ are shown at the top of the figure.

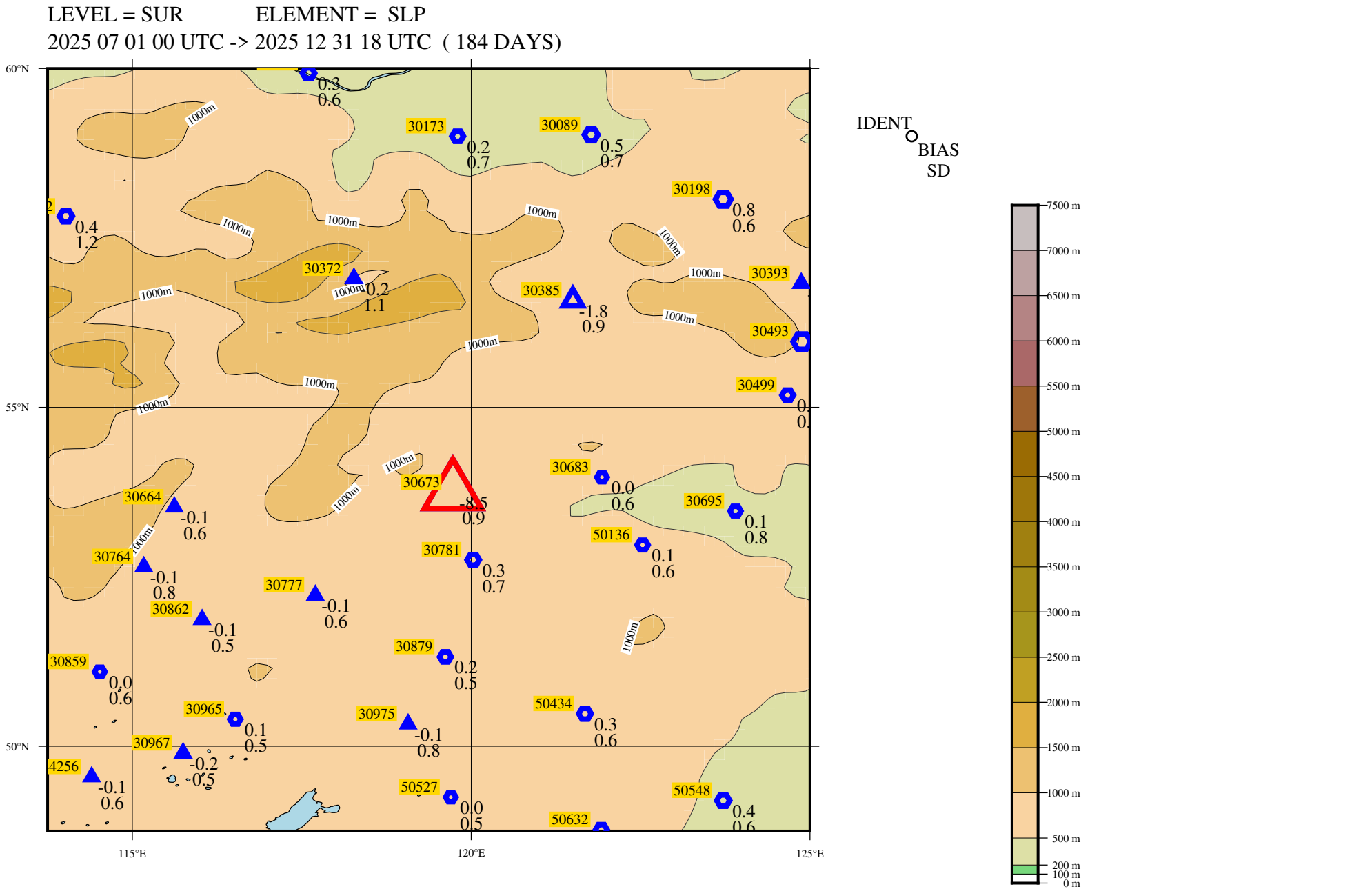

Figure 2 BIAS and SD of SLP for station 30673 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

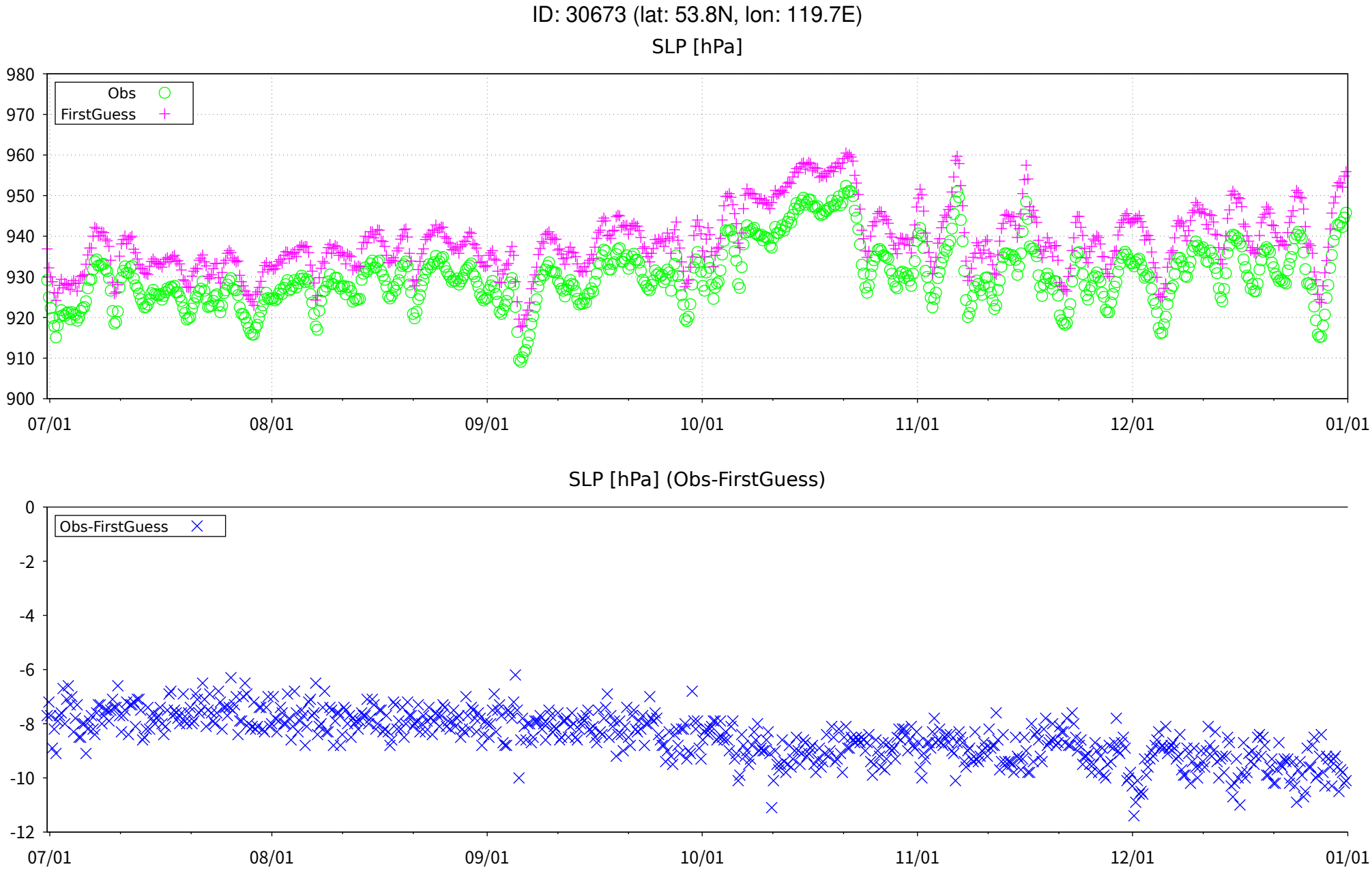

Figure 3 Time-series representation of SLP Obs minus FirstGuess for station 30673

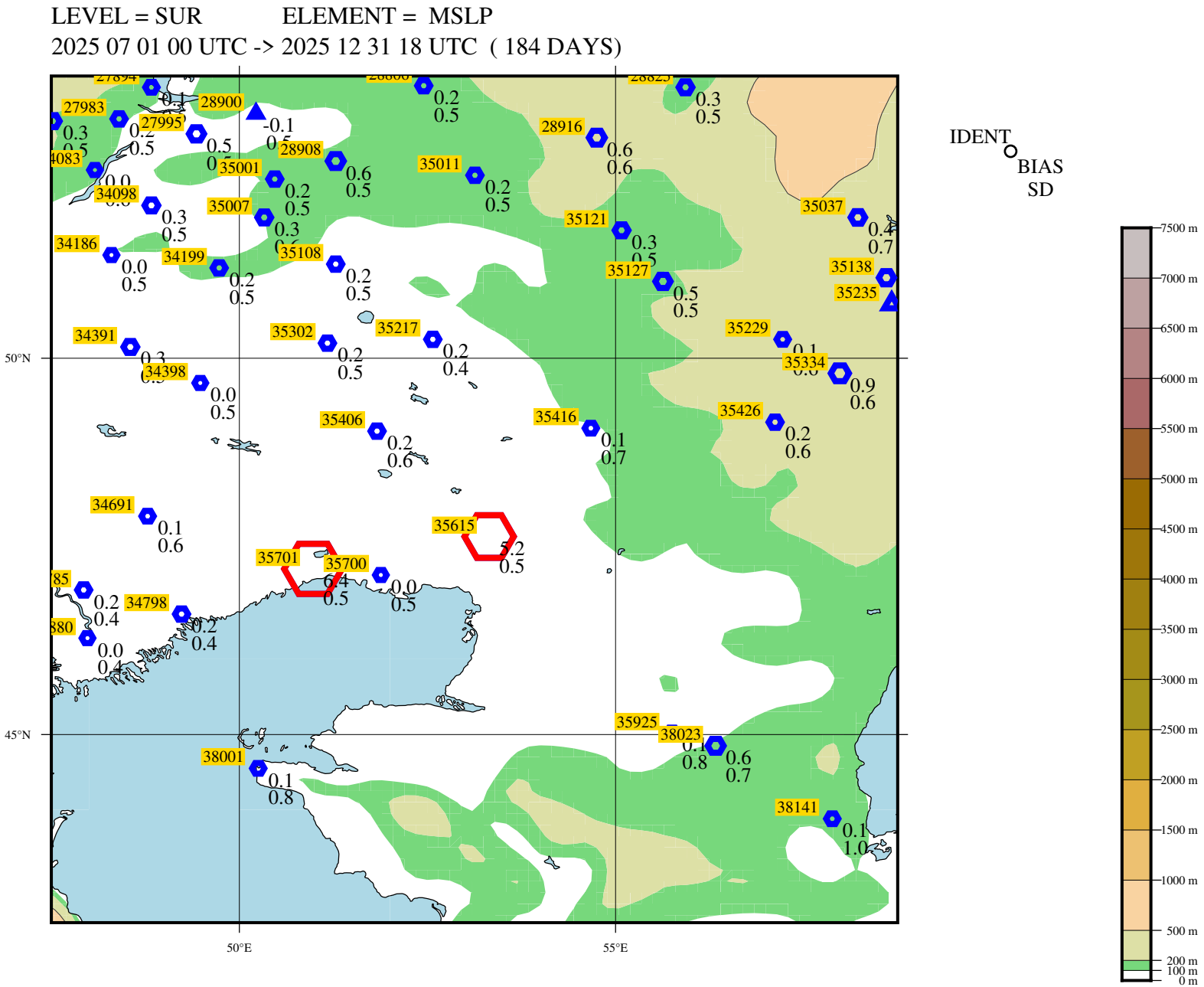

Figure 4 BIAS and SD of MSLP for station 35615, 35701 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

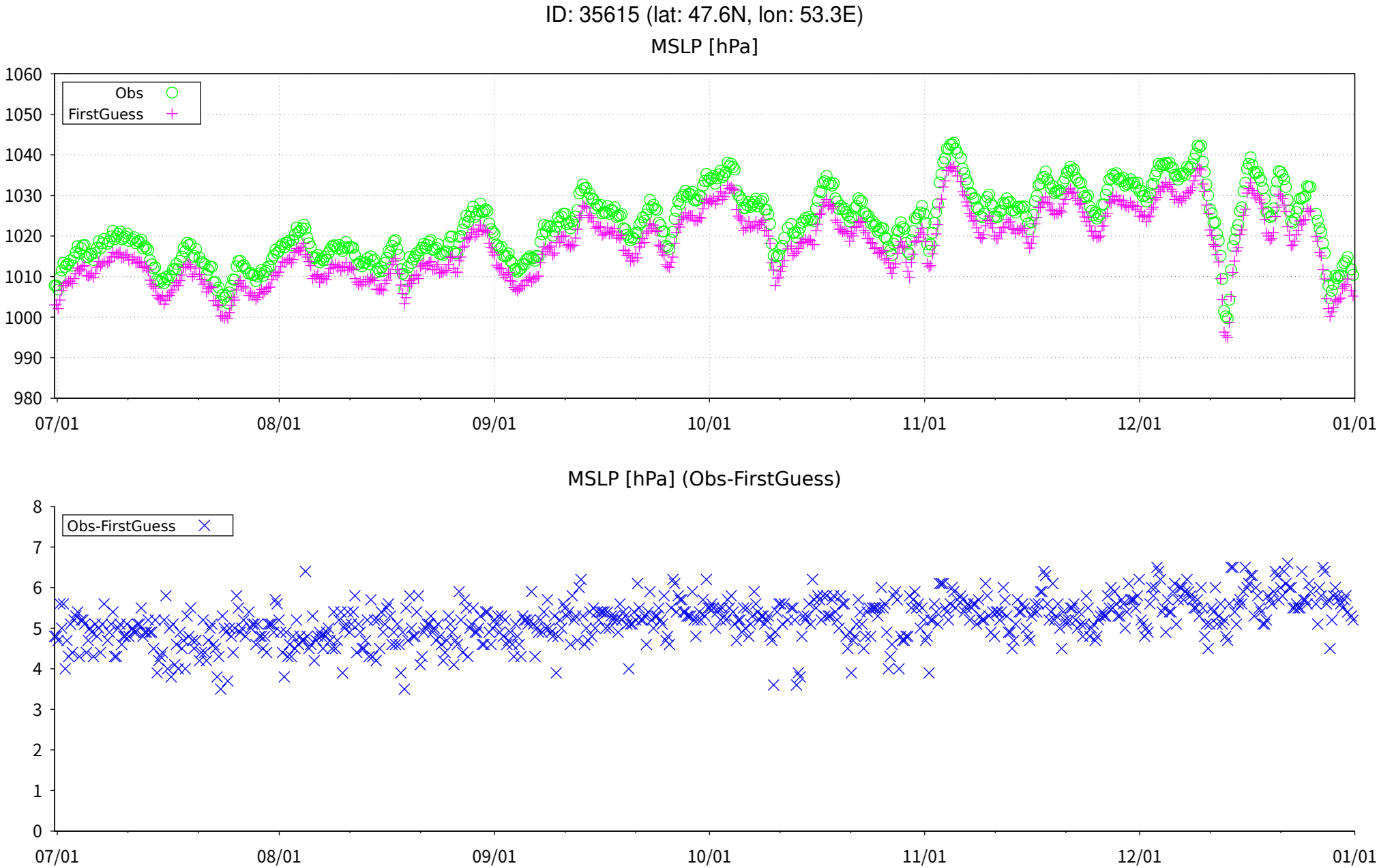

Figure 5 Time-series representation of MSLP Obs minus FirstGuess for station 35615

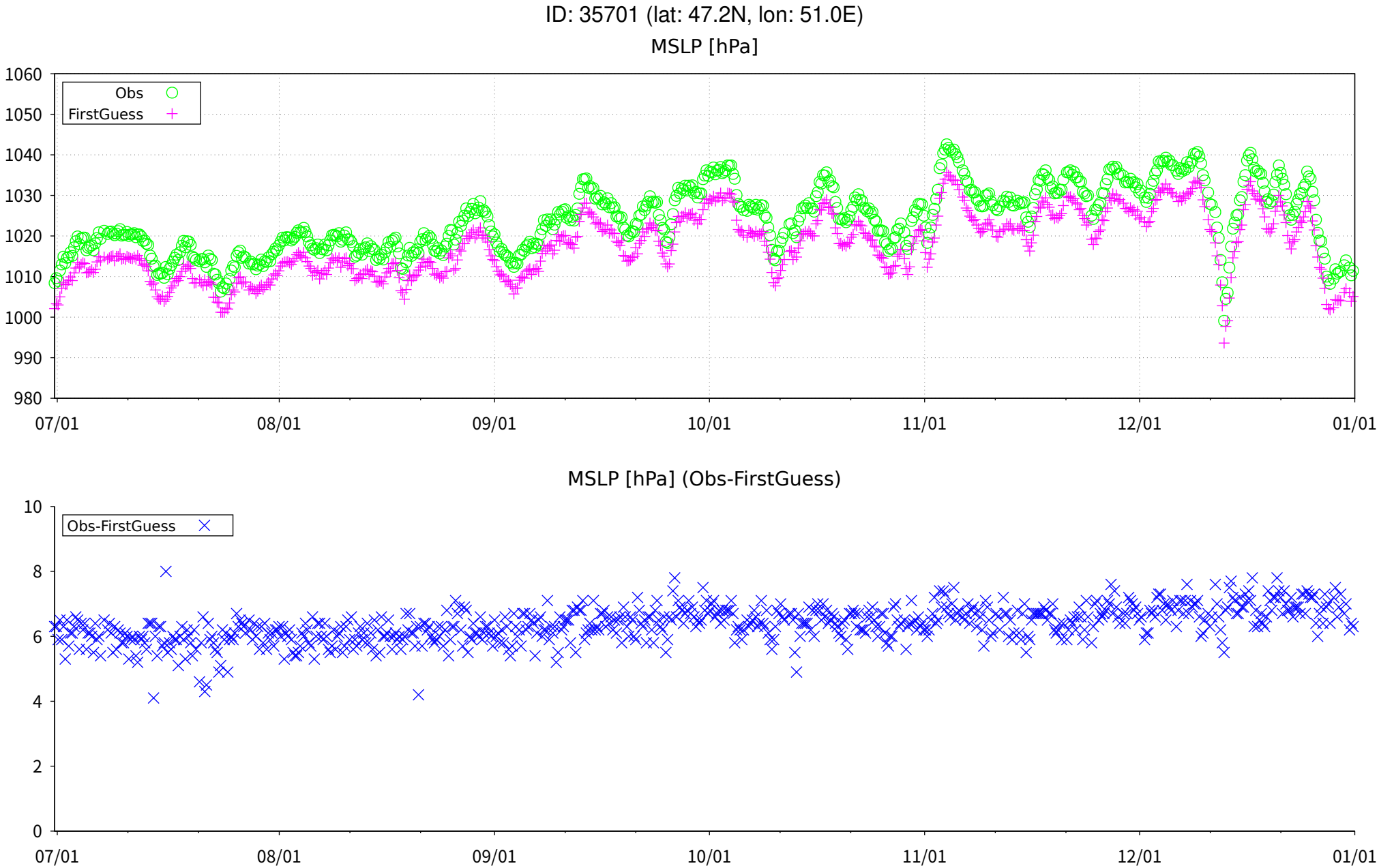

Figure 6 Time-series representation of MSLP Obs minus FirstGuess for station 35701

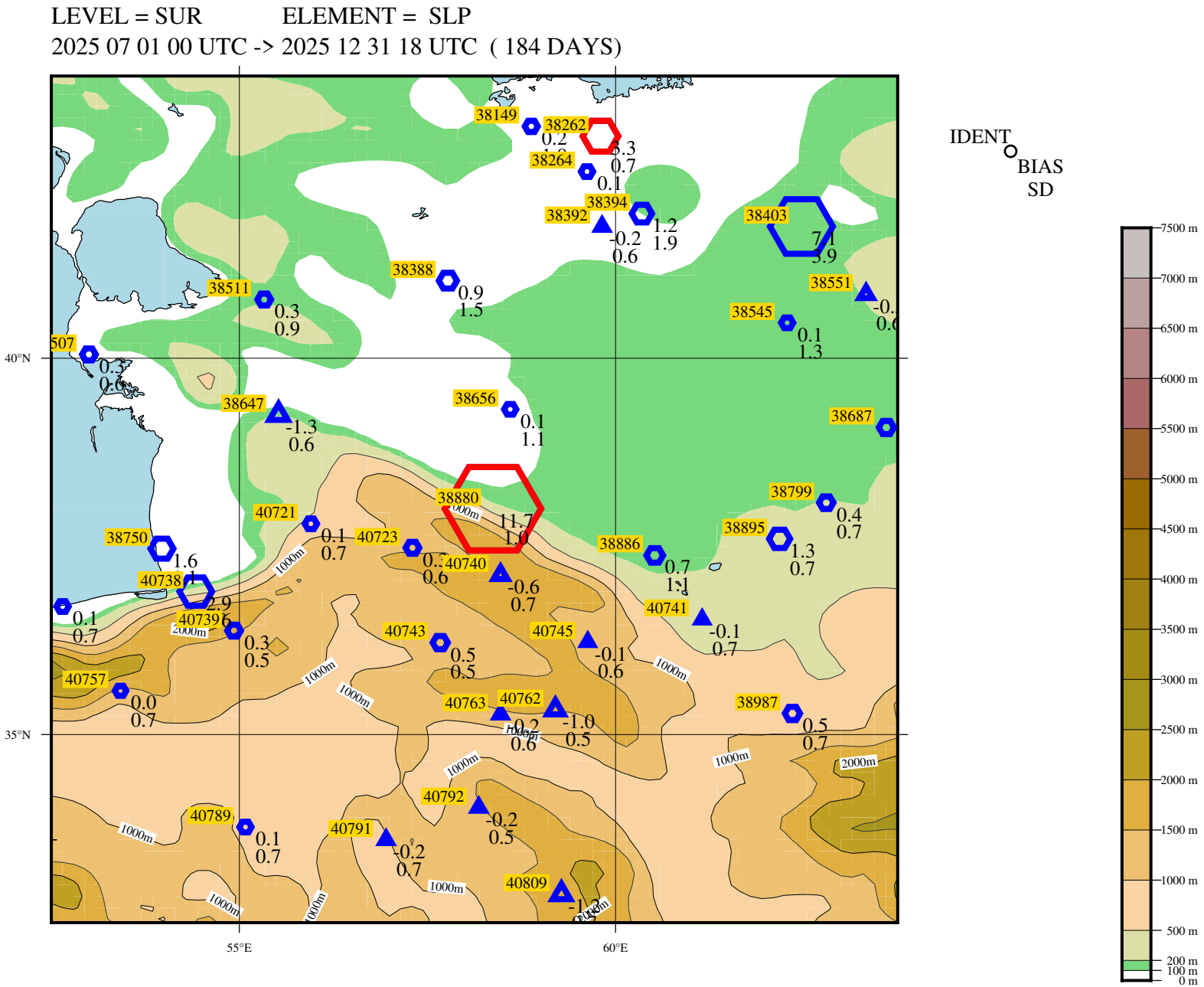

Figure 7 BIAS and SD of SLP for station 38262, 38880 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

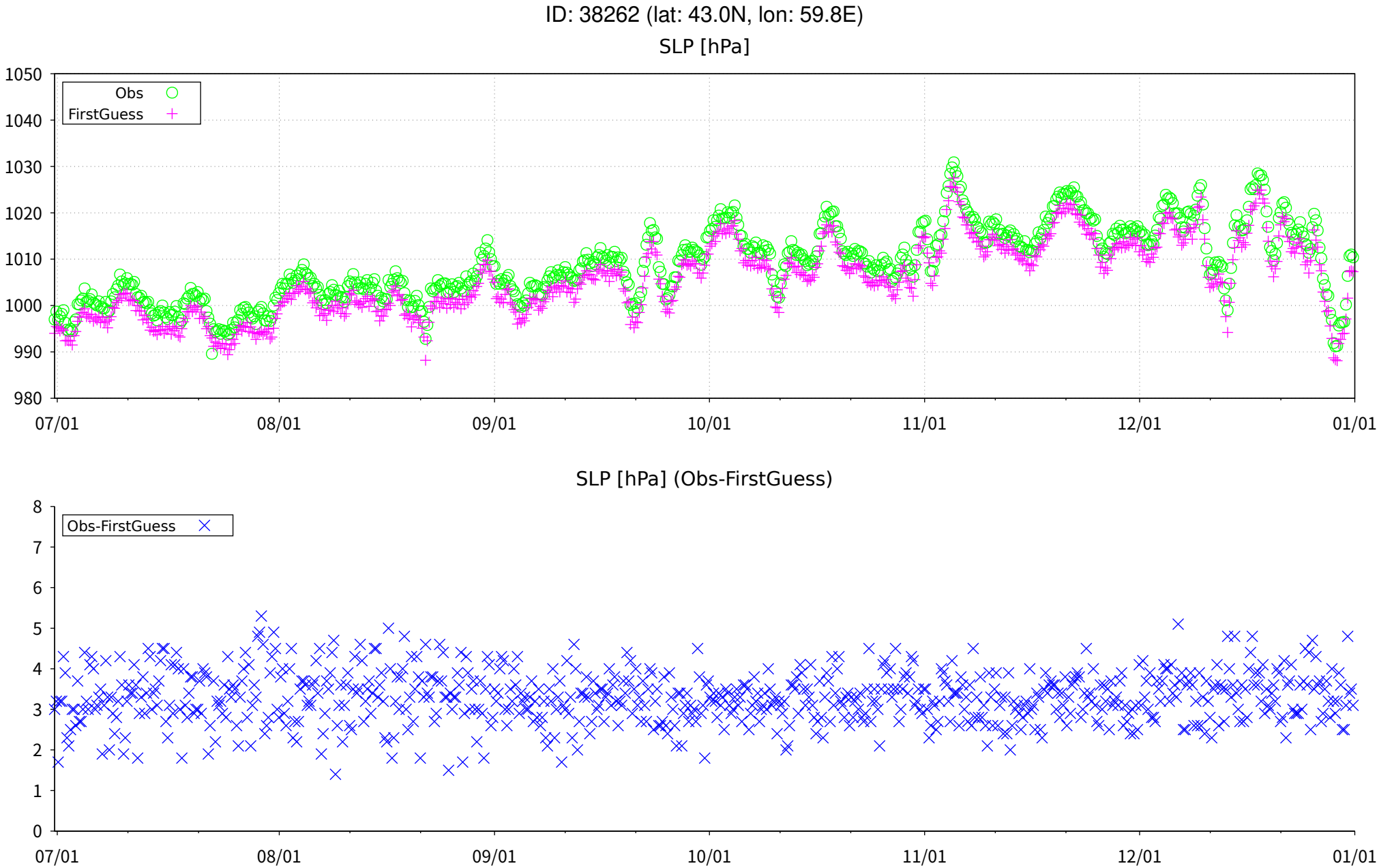

Figure 8 Time-series representation of SLP Obs minus FirstGuess for station 38262

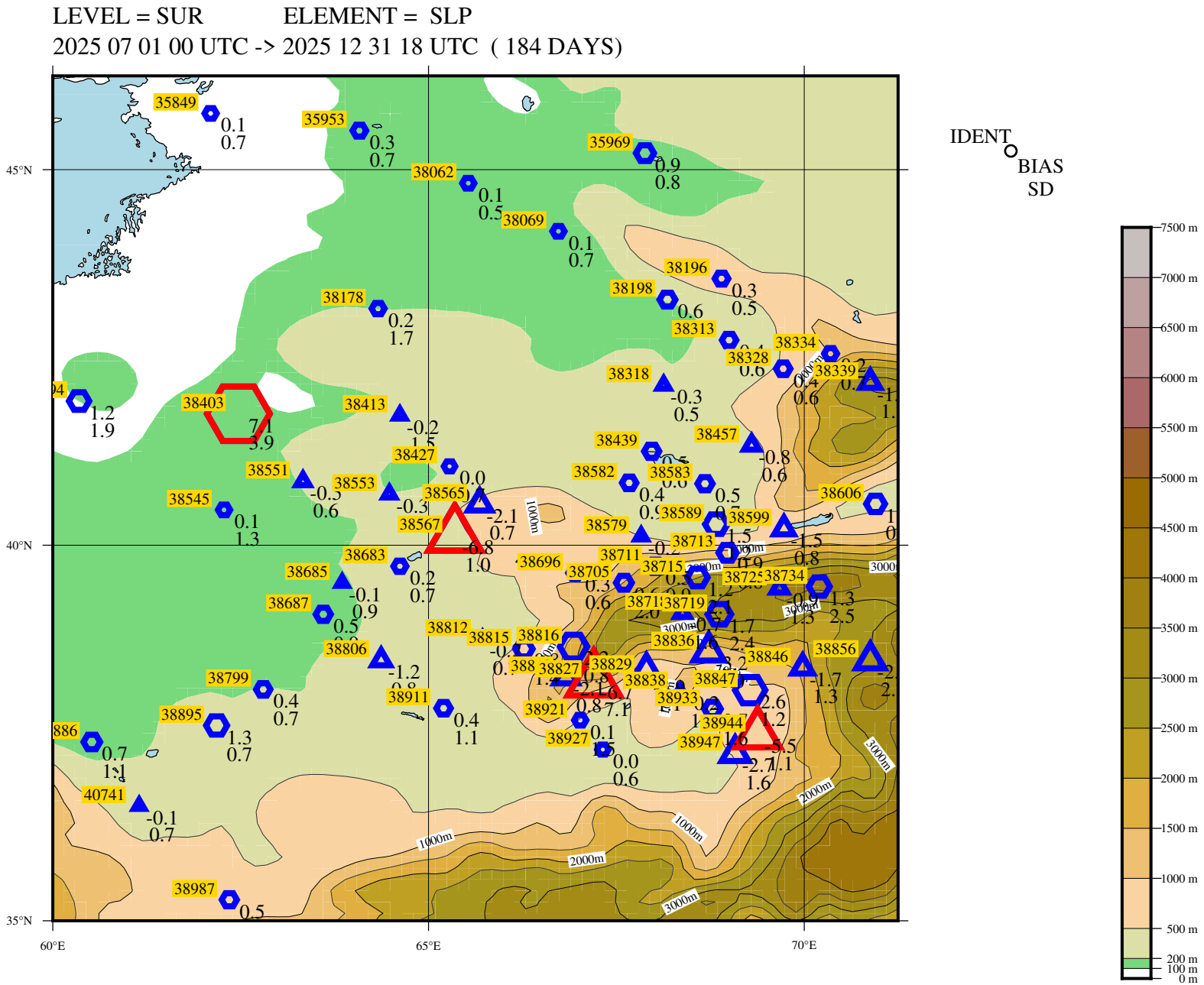

Figure 9 BIAS and SD of SLP for station 38403, 38567, 38827, 38944 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

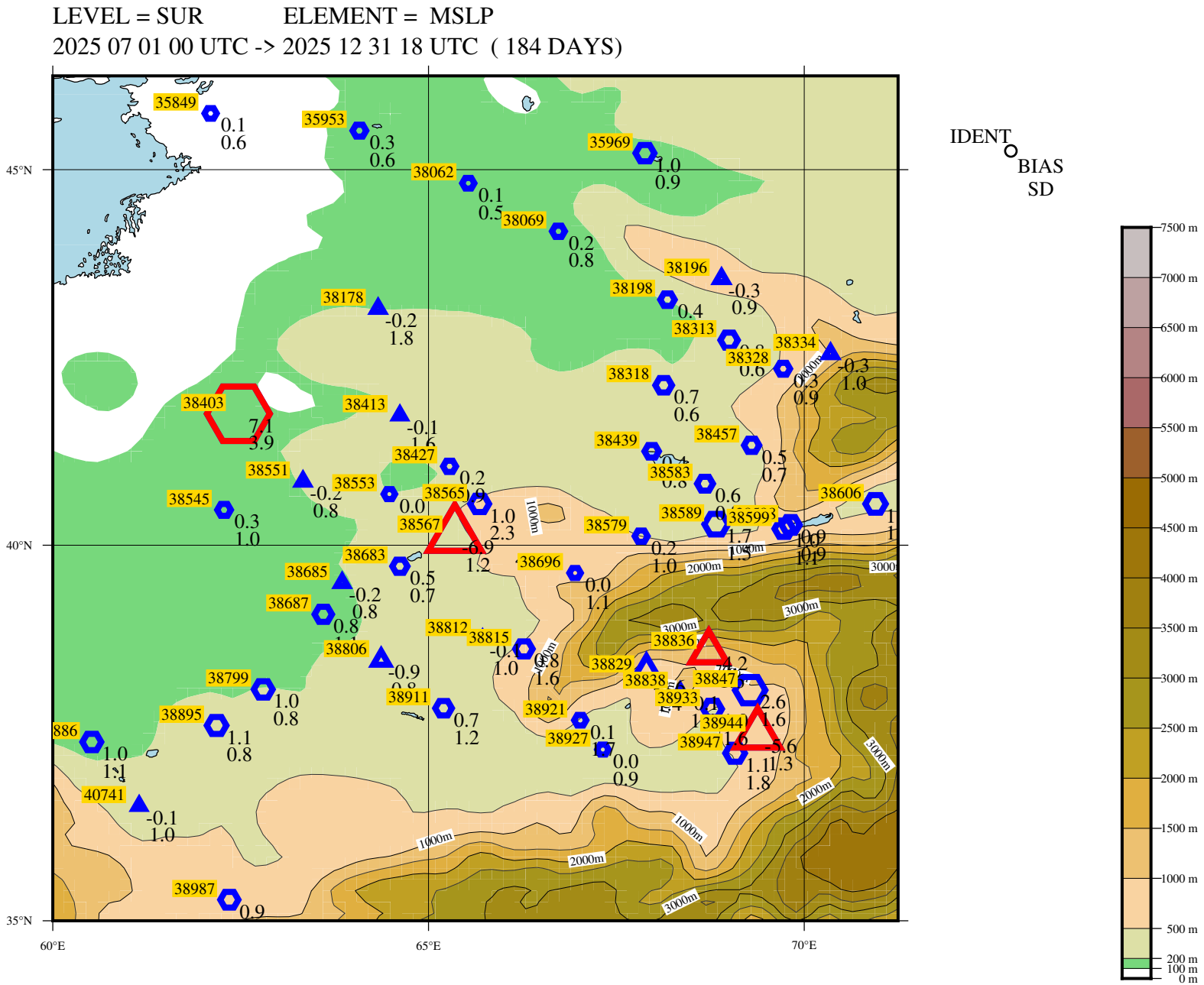

Figure 10 BIAS and SD of MSLP for station 38403, 38567, 38836, 38944 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

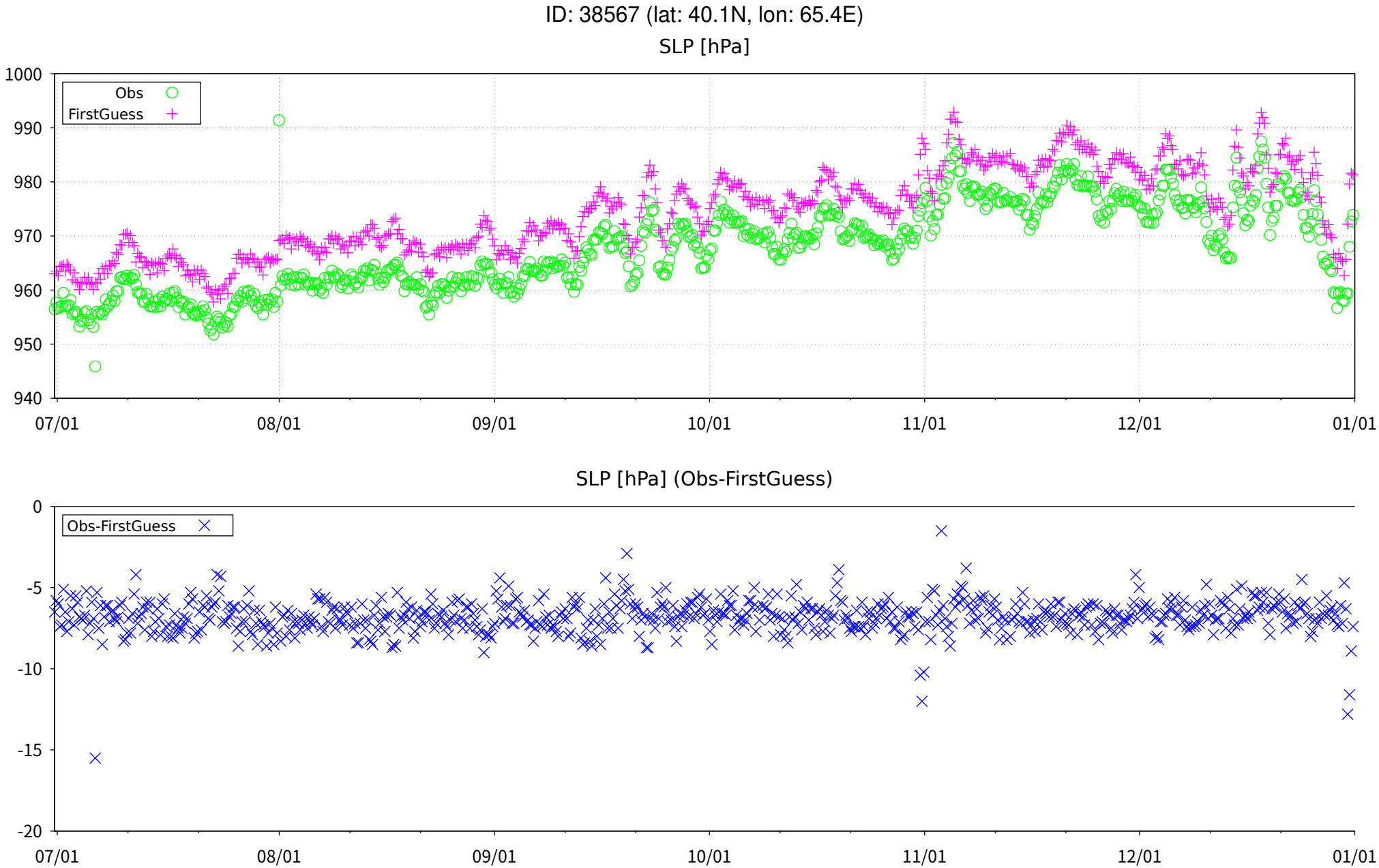

Figure 11(a) Time-series representation of SLP Obs minus FirstGuess for station 38567

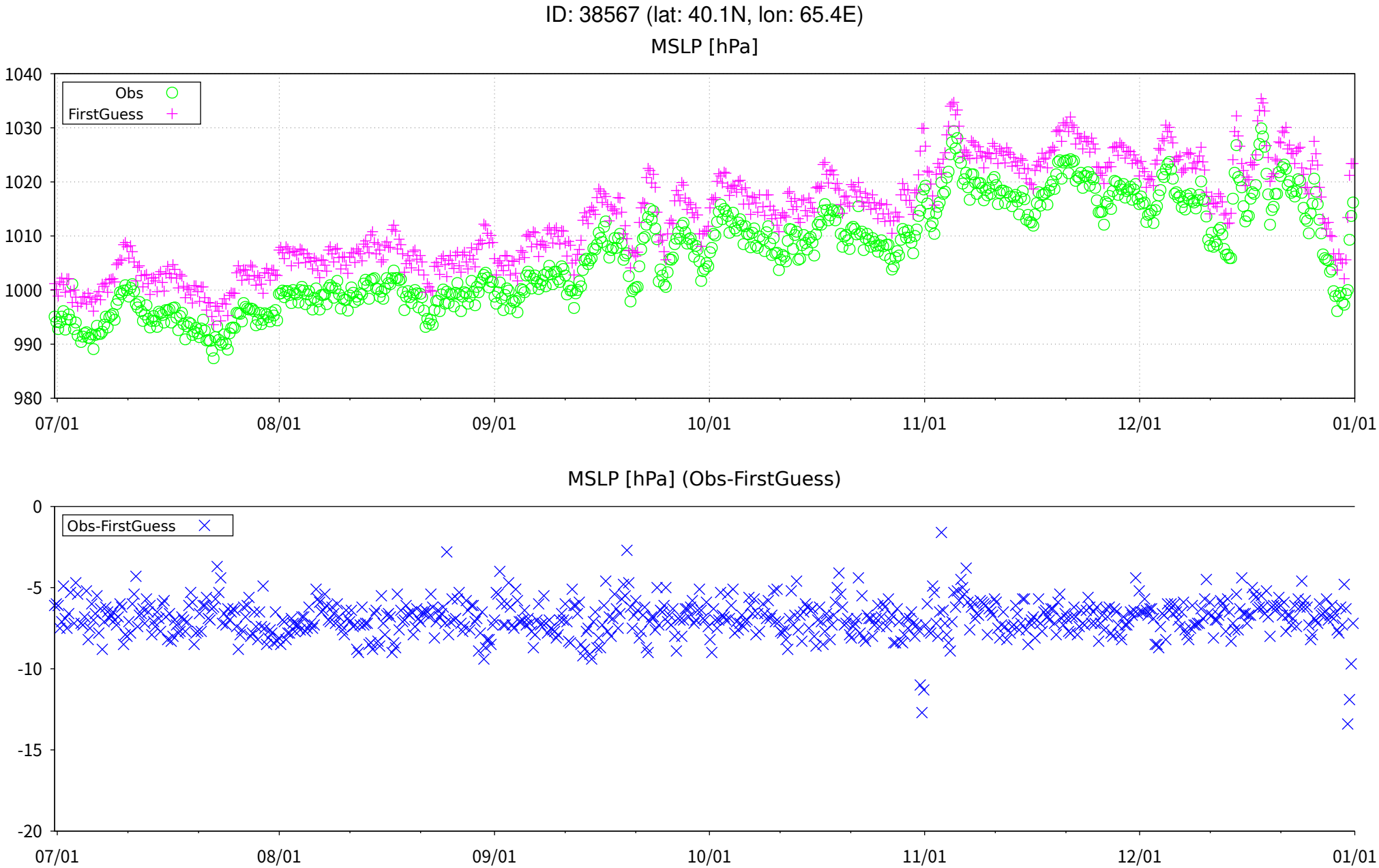

Figure 11(b) Time-series representation of MSLP Obs minus FirstGuess for station 38567

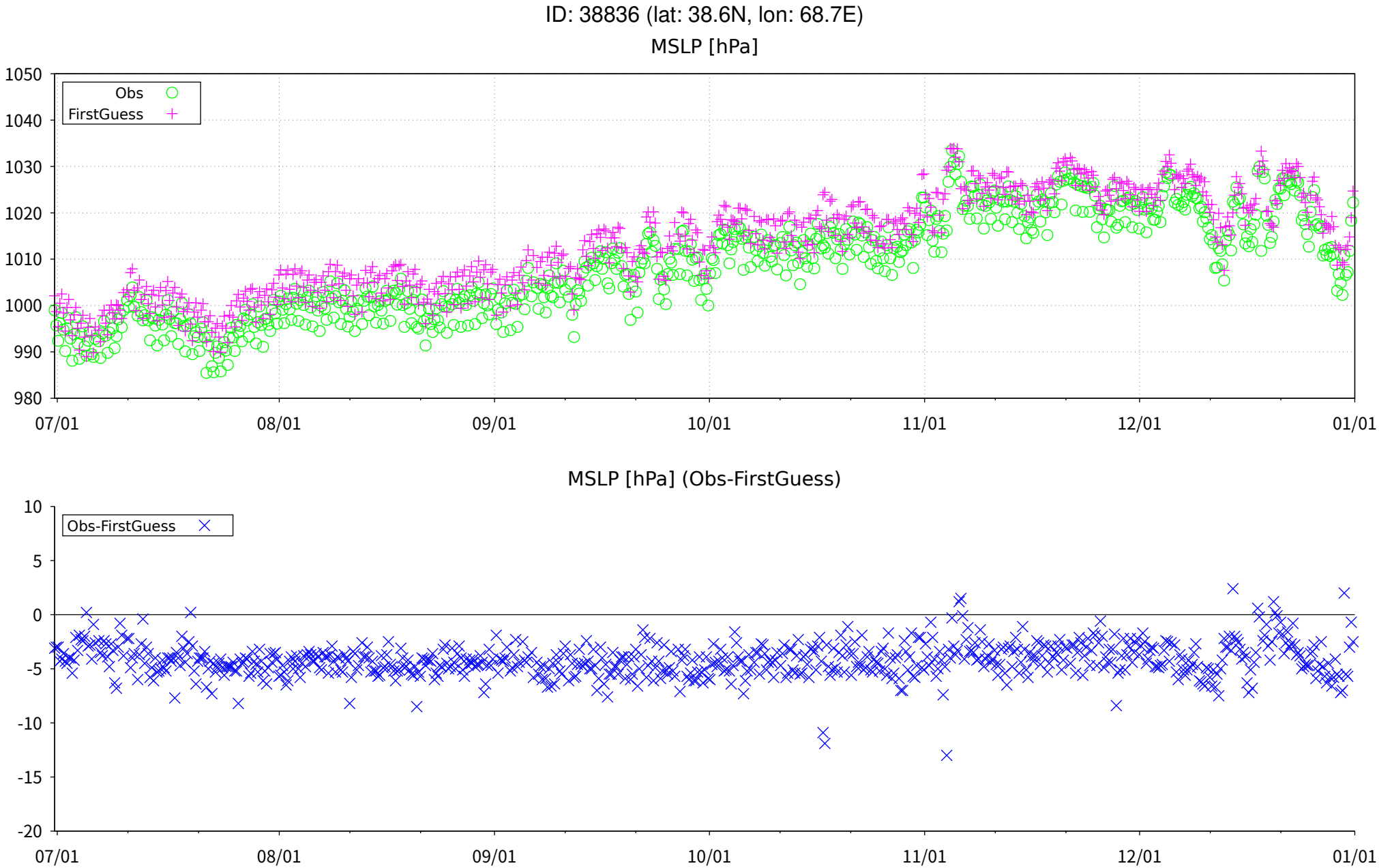

Figure 12 Time-series representation of MSLP Obs minus FirstGuess for station 38836

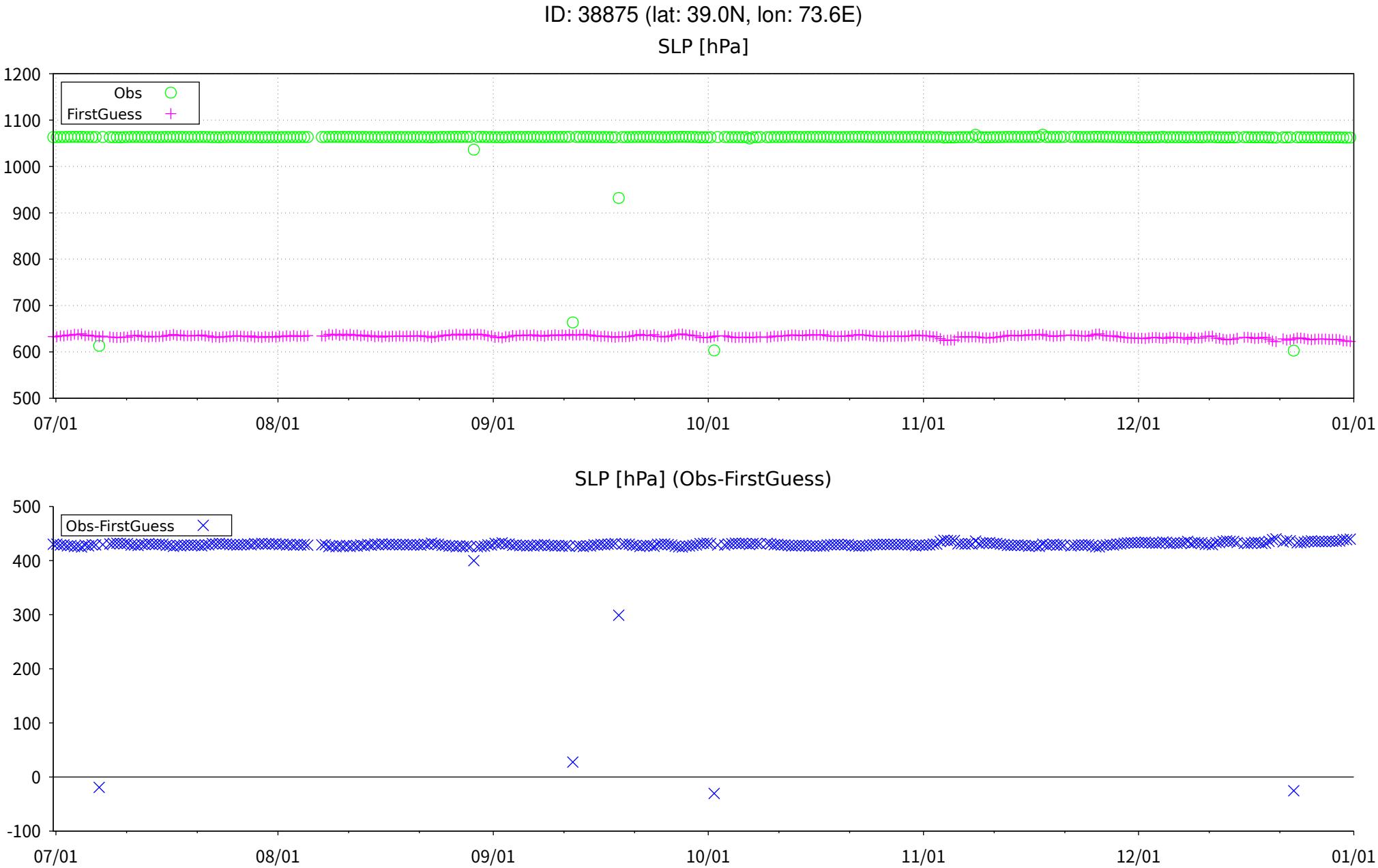

Figure 13 Time-series representation of SLP Obs minus FirstGuess for station 38875

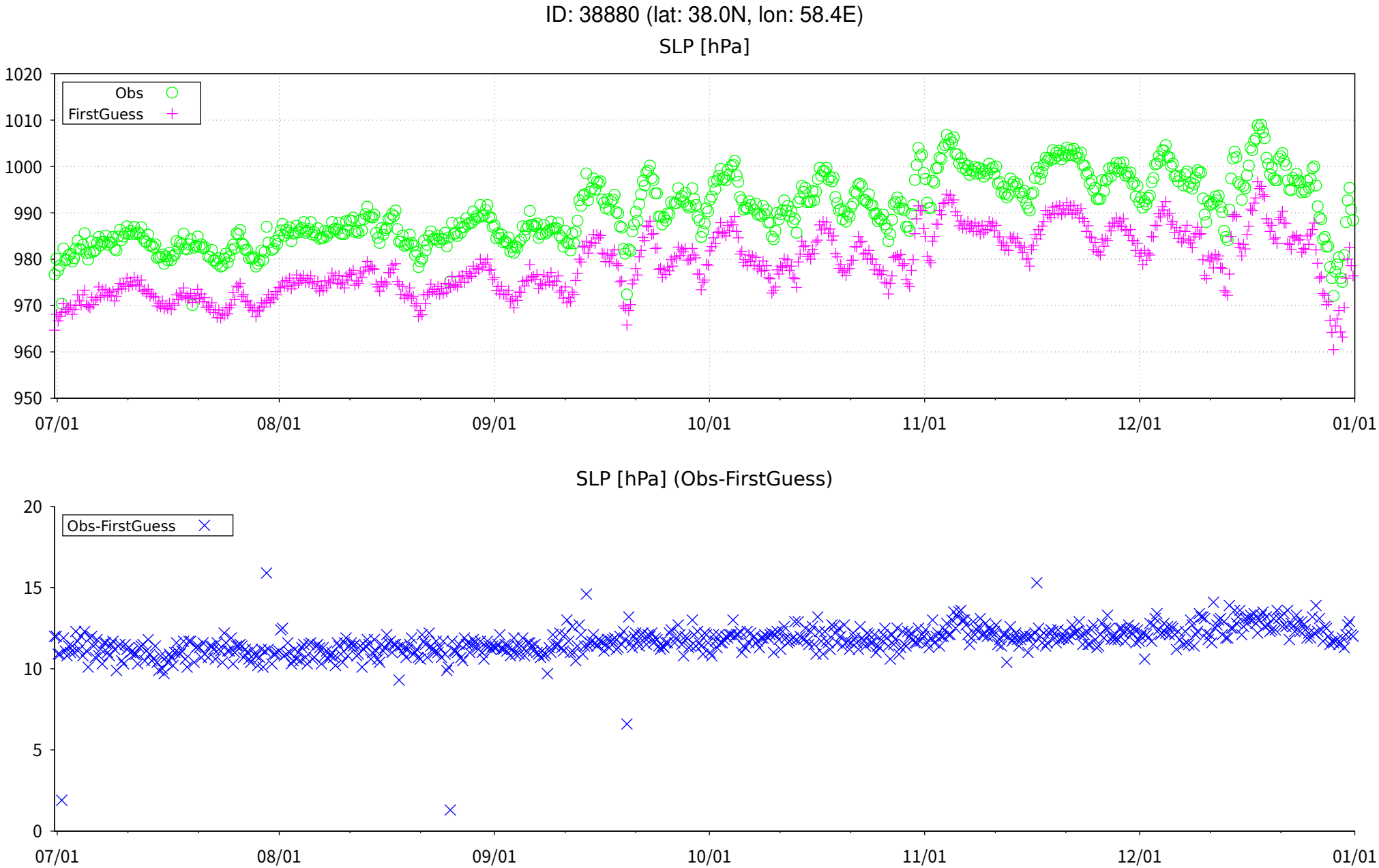

Figure 14 Time-series representation of SLP Obs minus FirstGuess for station 38880

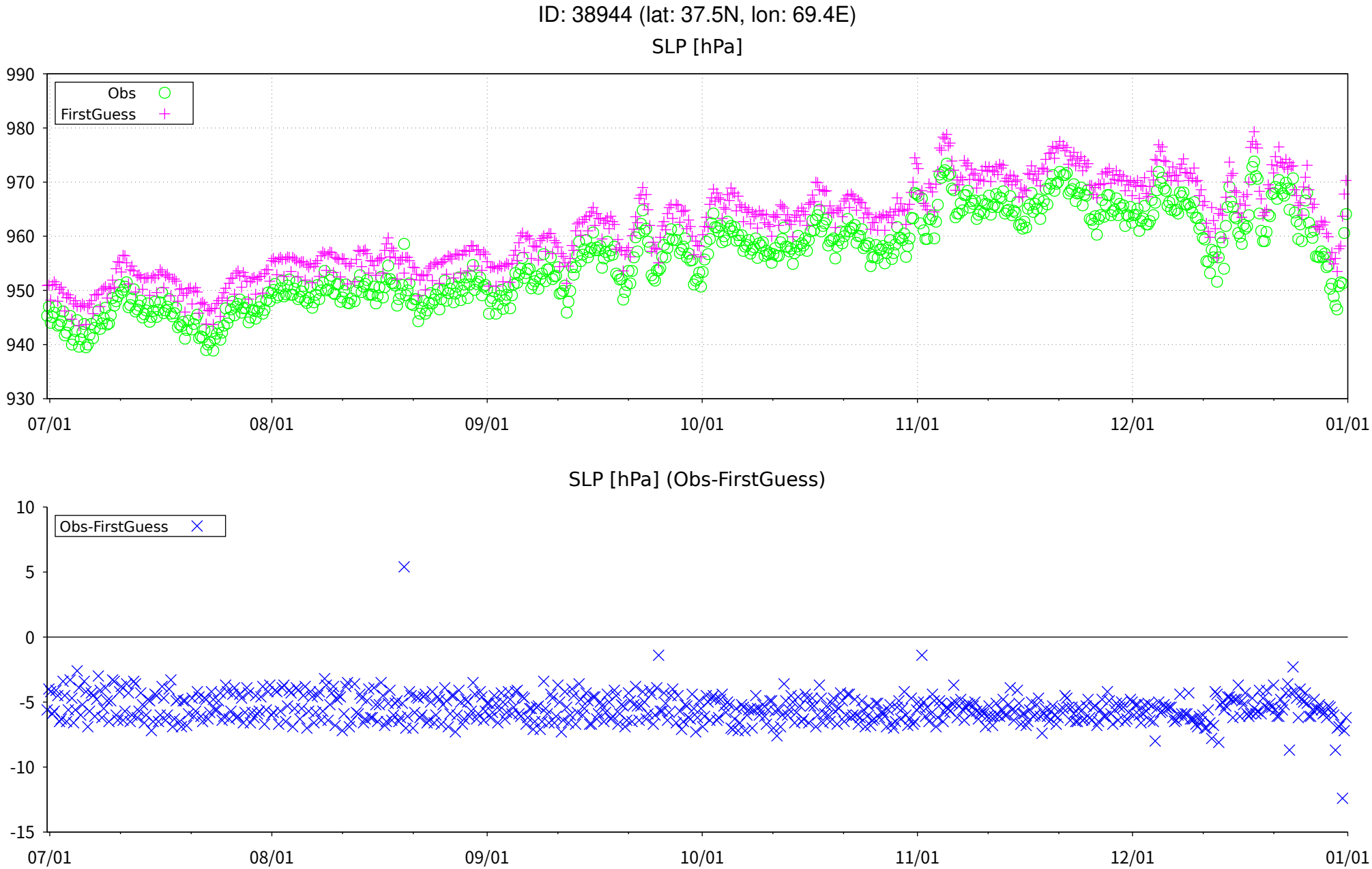

Figure 15(a) Time-series representation of SLP Obs minus FirstGuess for station 38944

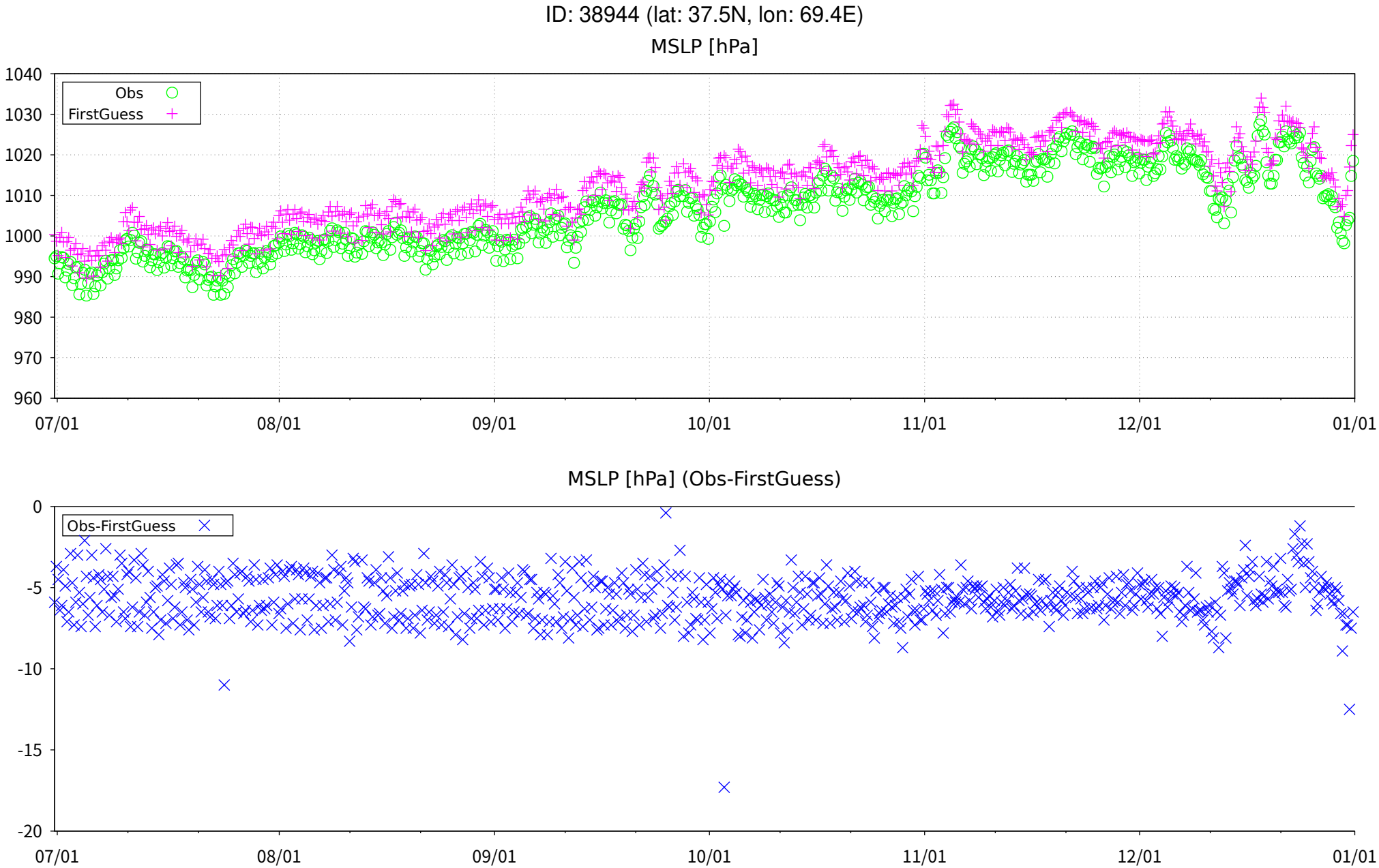

Figure 15(b) Time-series representation of MSLP Obs minus FirstGuess for station 38944

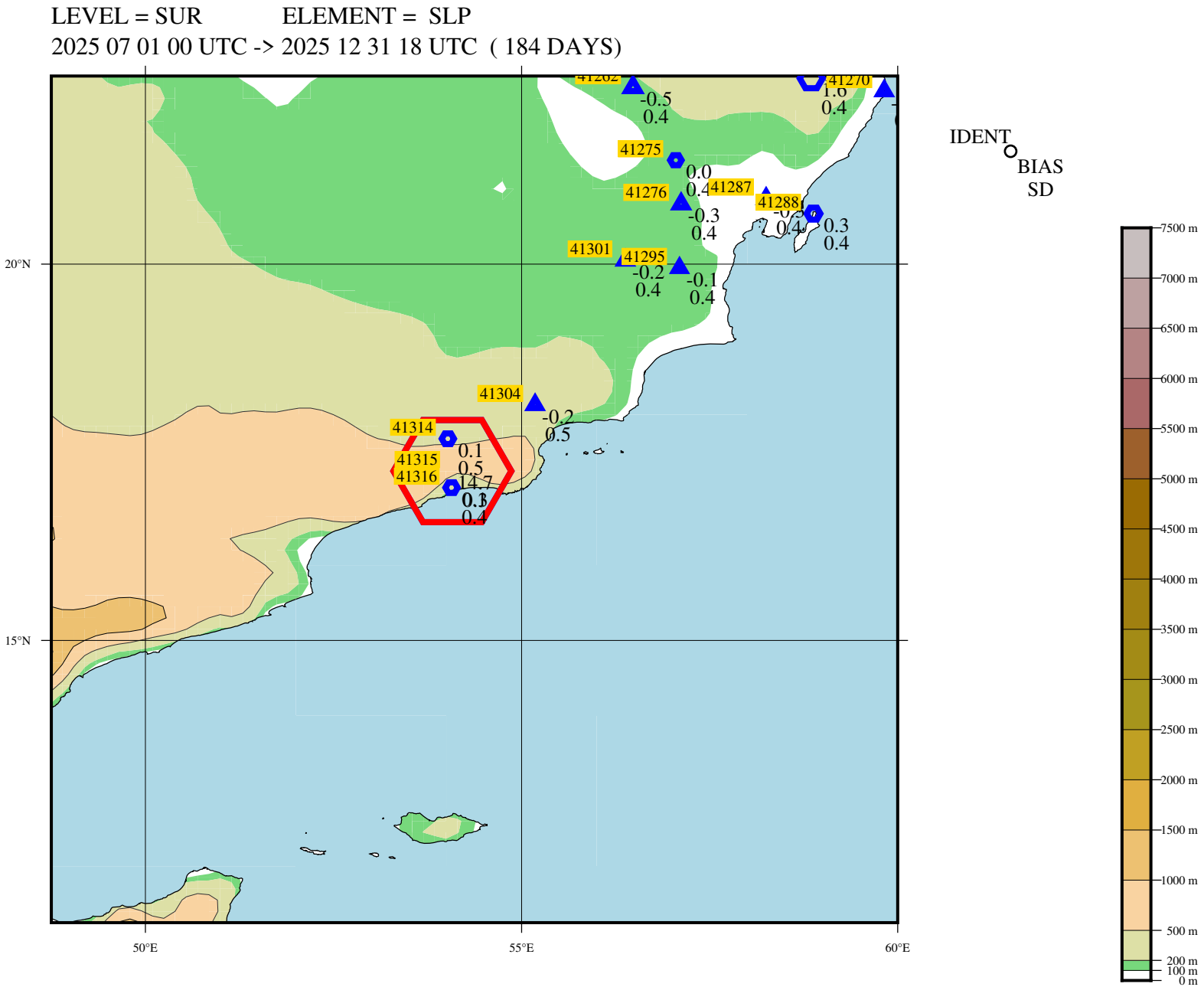

Figure 16 BIAS and SD of SLP for station 41315 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

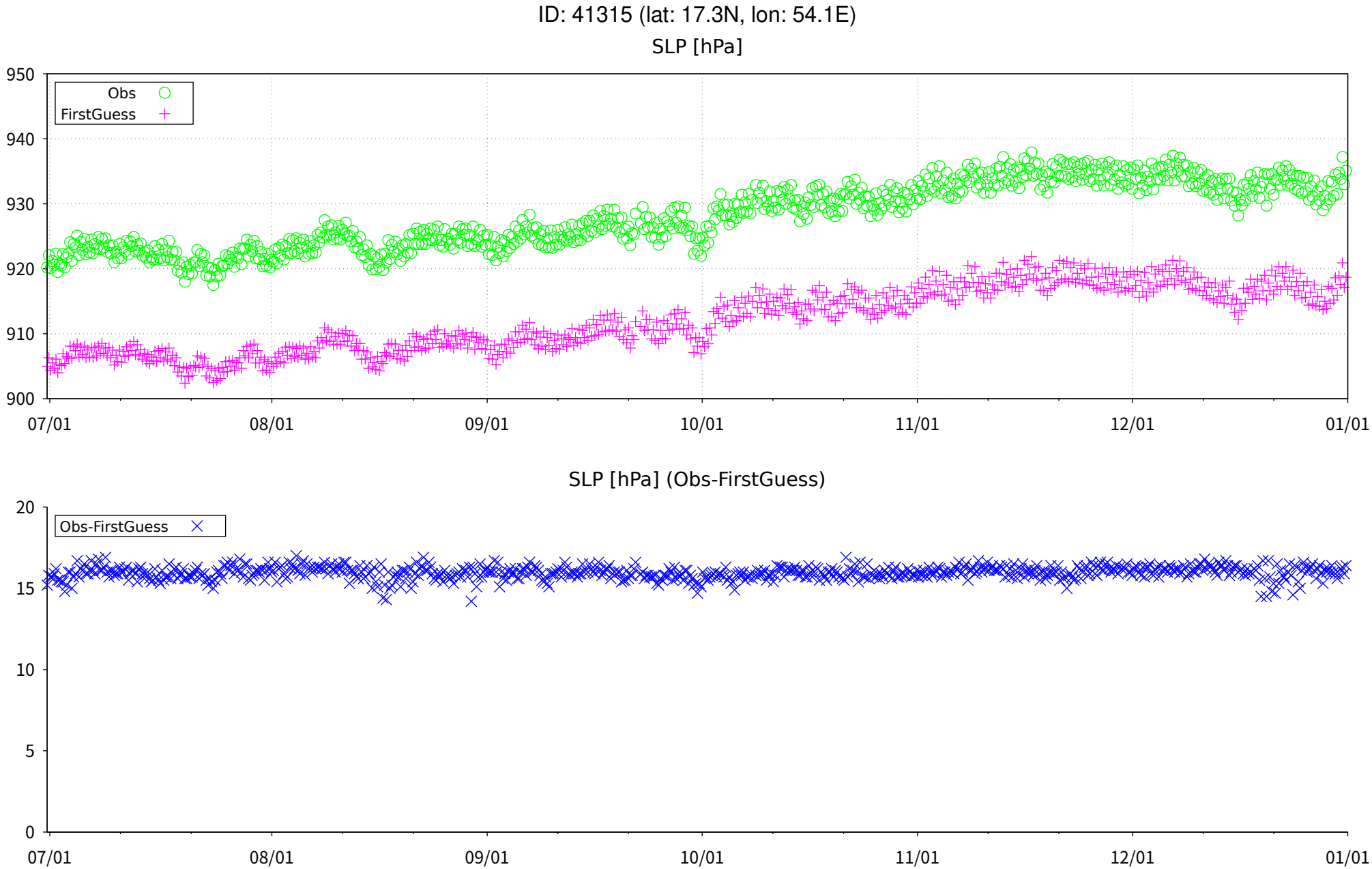

Figure 17(a) Time-series representation of SLP Obs minus FirstGuess for station 41315

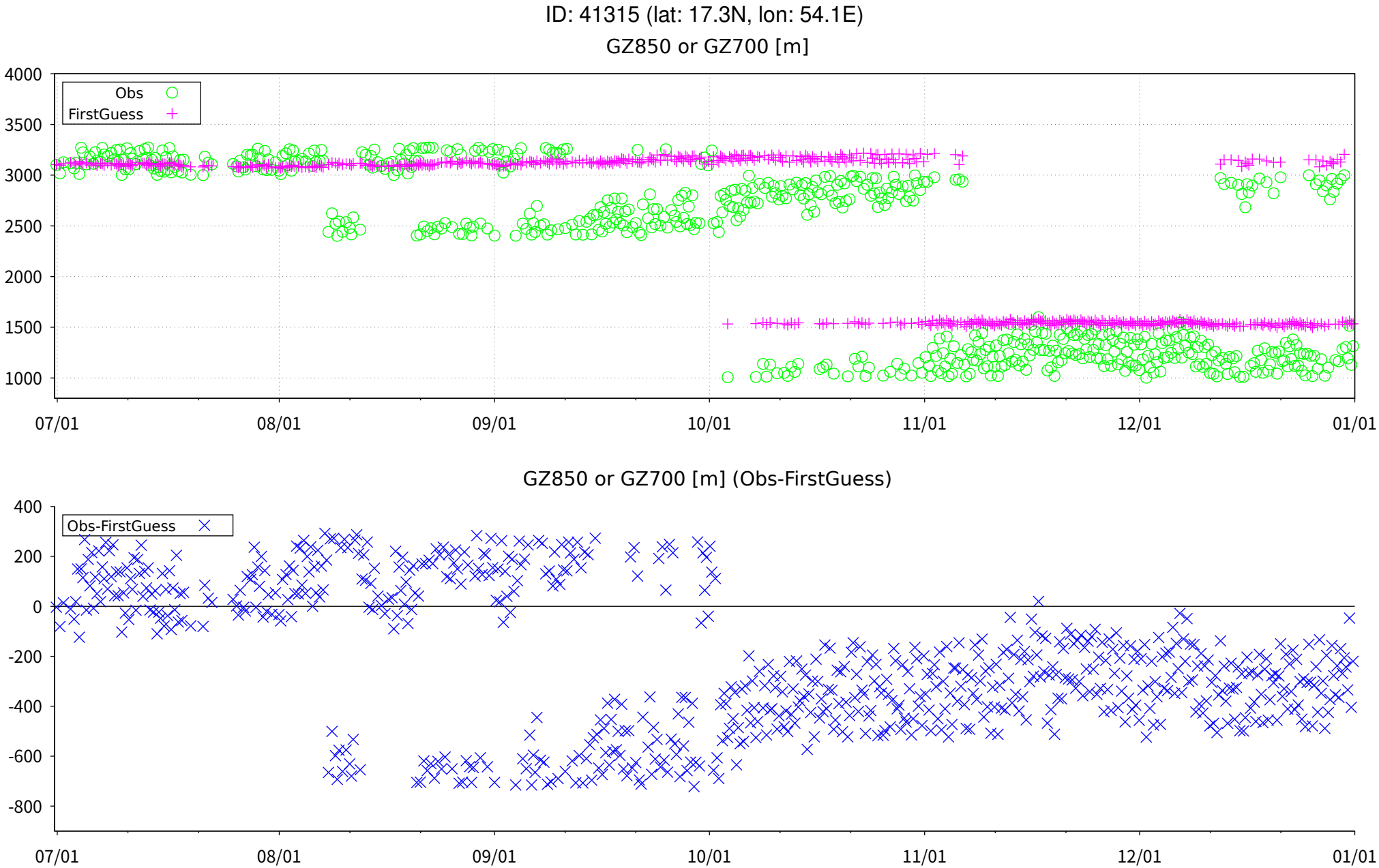

Figure 17(b) Time-series representation of GZ850 or GZ700 Obs minus FirstGuess for station 41315

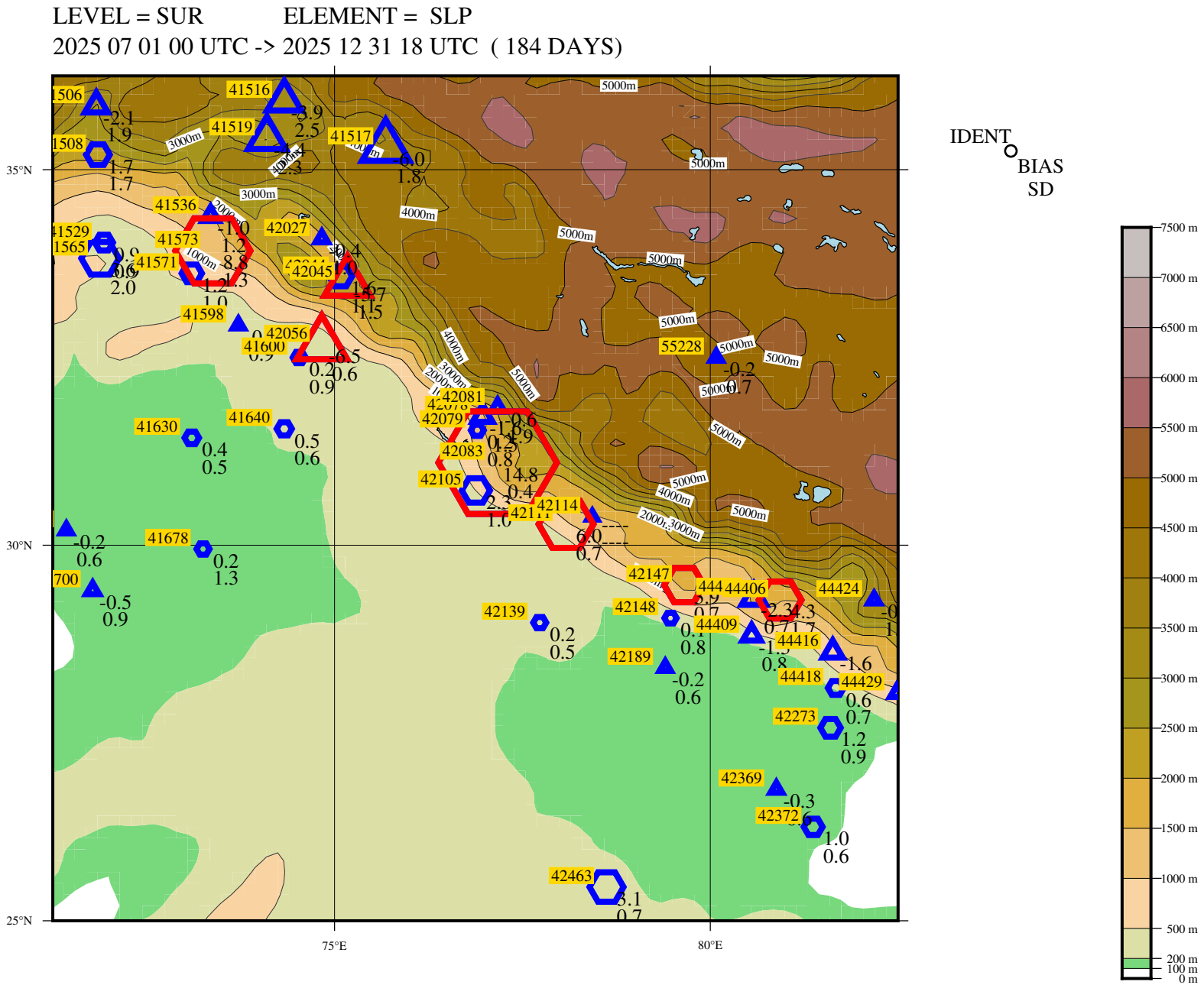

Figure 18 BIAS and SD of SLP for station 41573, 42045, 42056, 42083, 42111, 42147, 44406 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

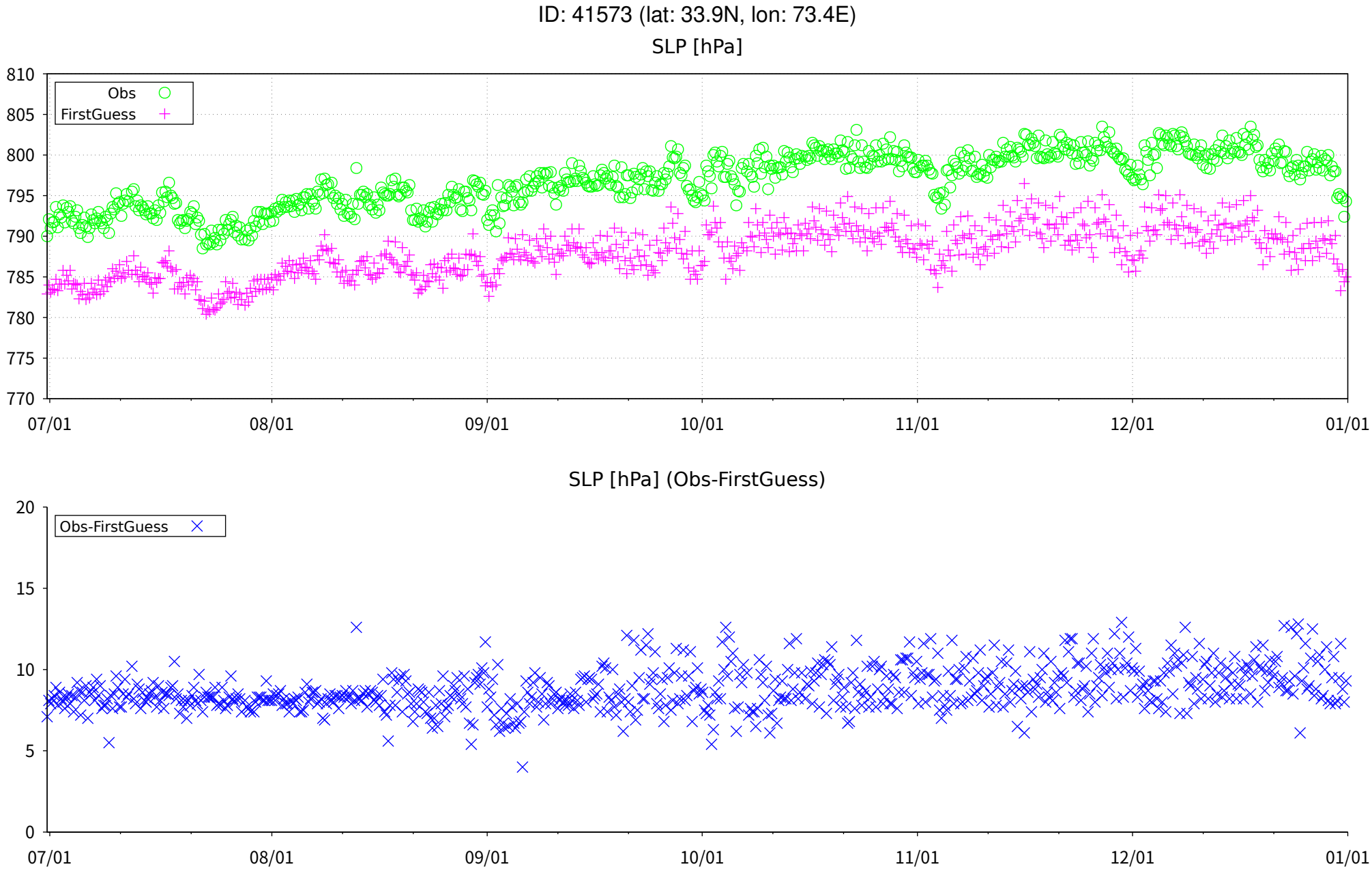

Figure 19 Time-series representation of SLP Obs minus FirstGuess for station 41573

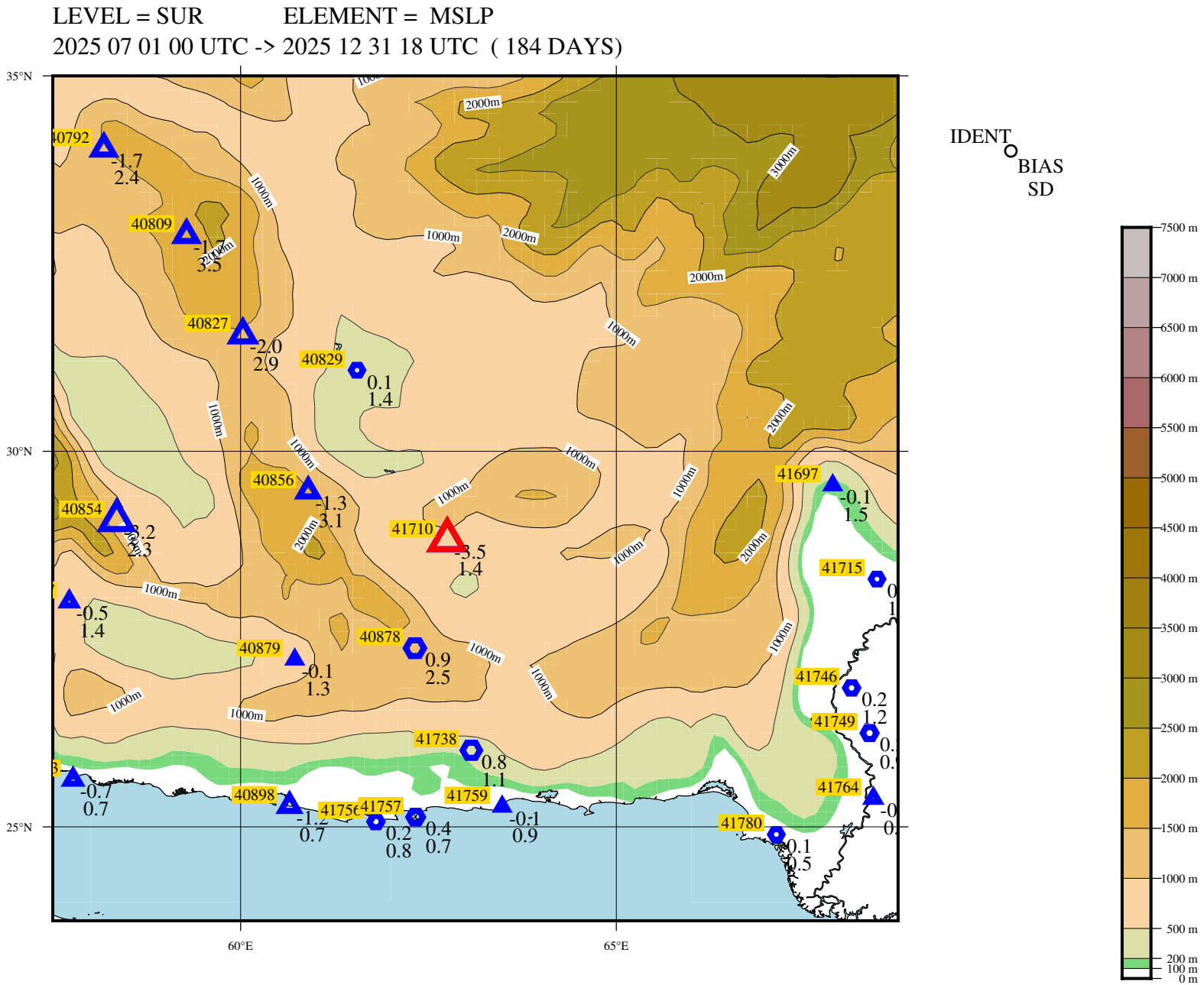

Figure 20 BIAS and SD of MSLP for station 41710 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

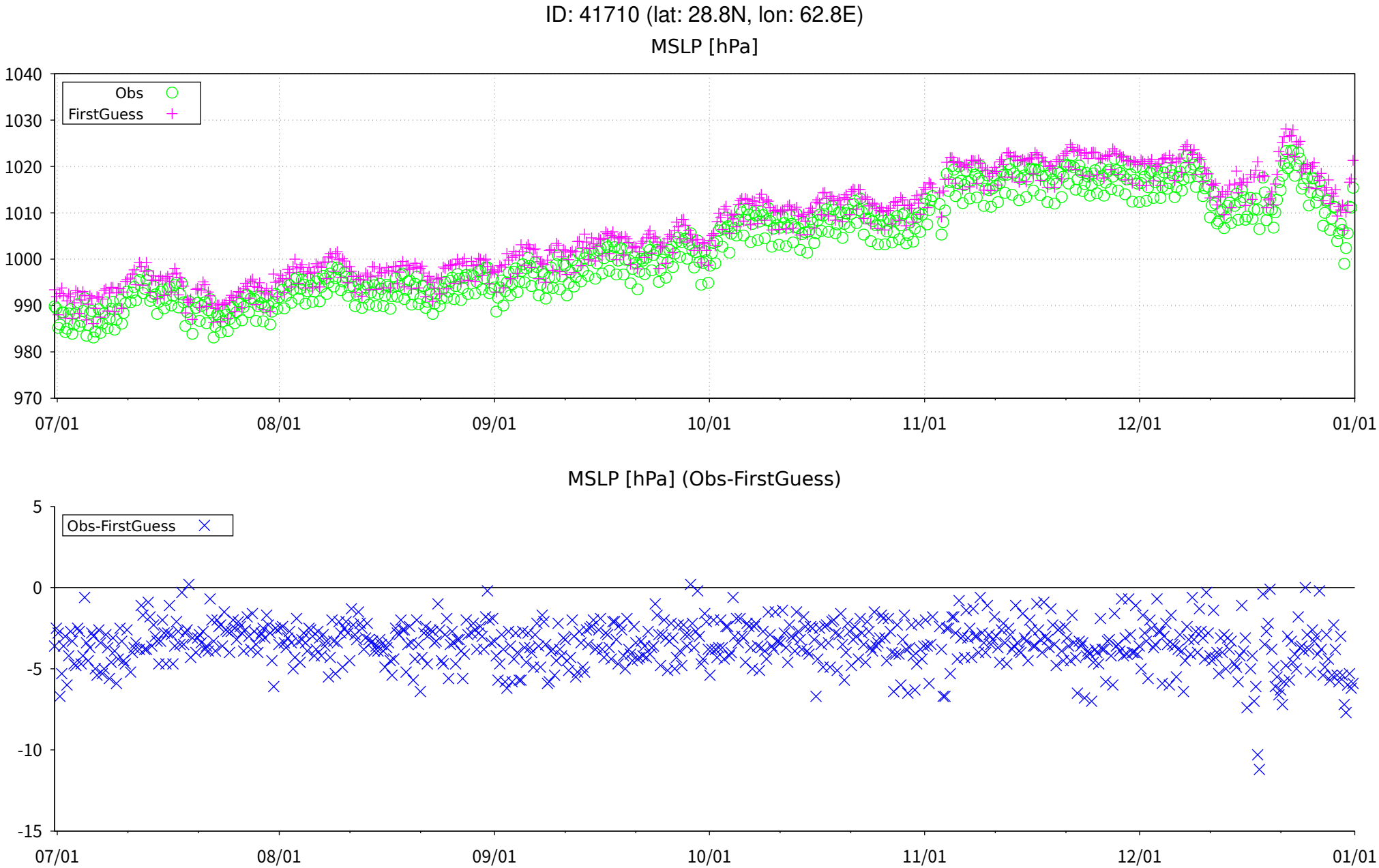

Figure 21 Time-series representation of MSLP Obs minus FirstGuess for station 41710

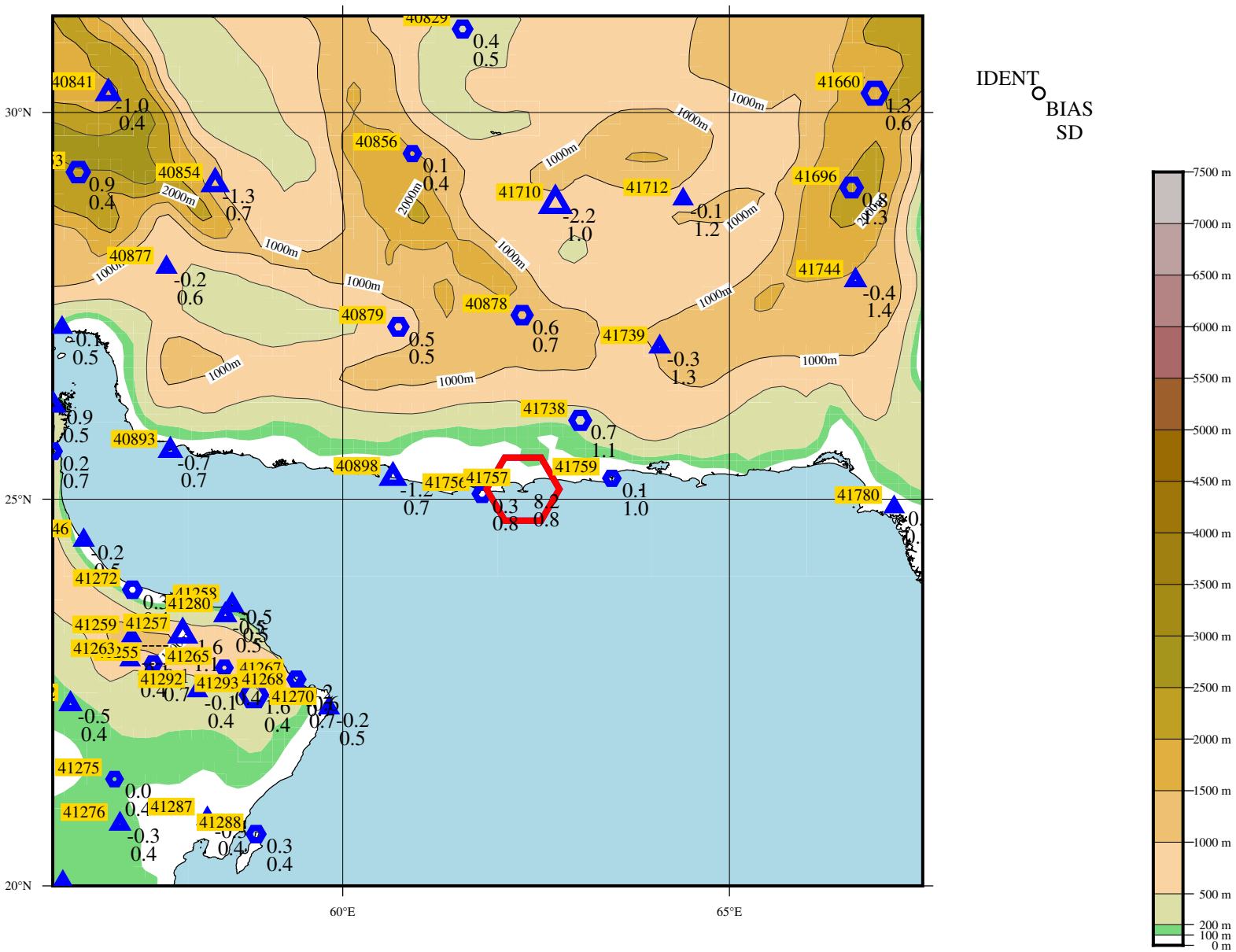

Figure 22 BIAS and SD of SLP for station 41757 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

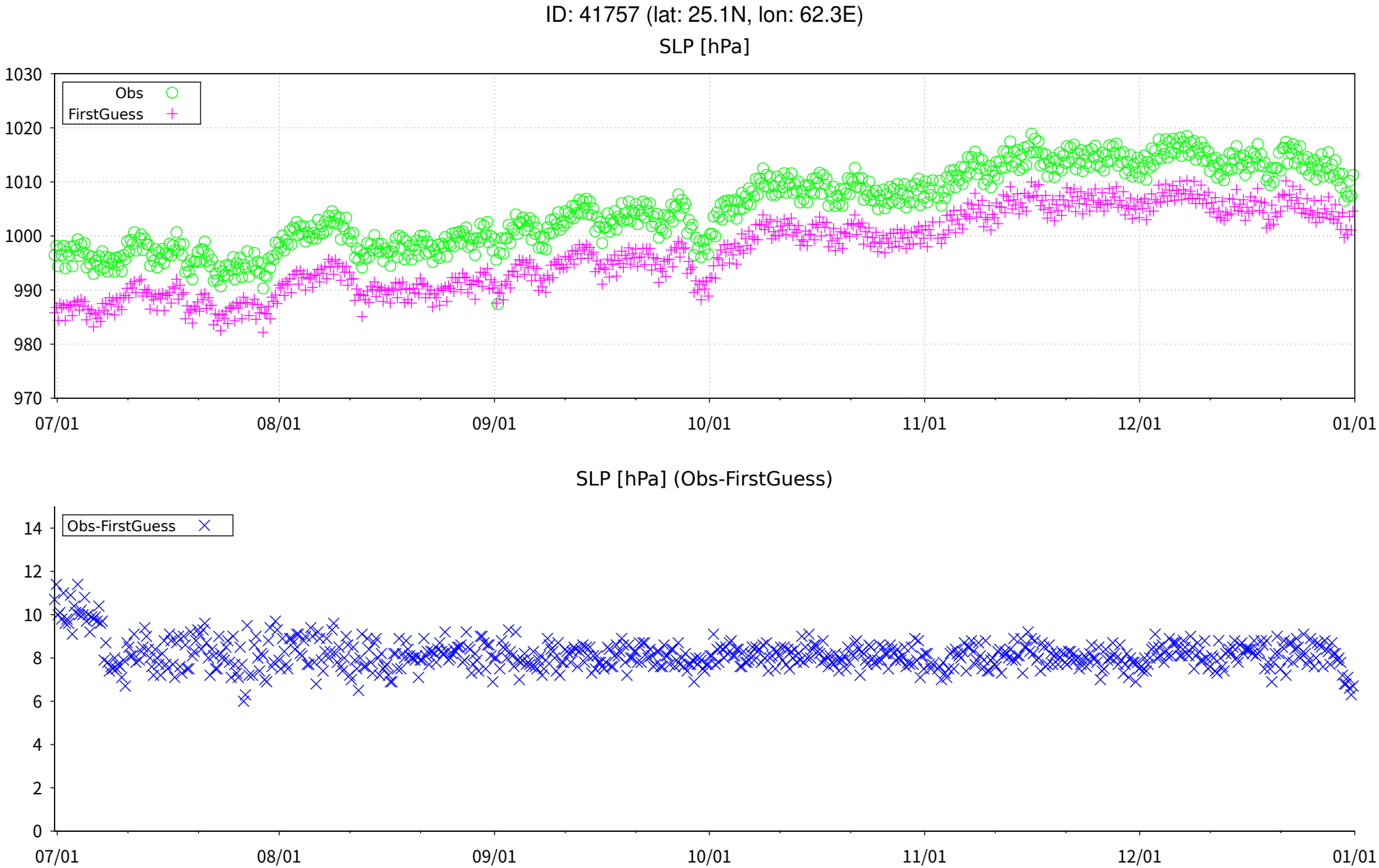

Figure 23 Time-series representation of SLP Obs minus FirstGuess for station 41757

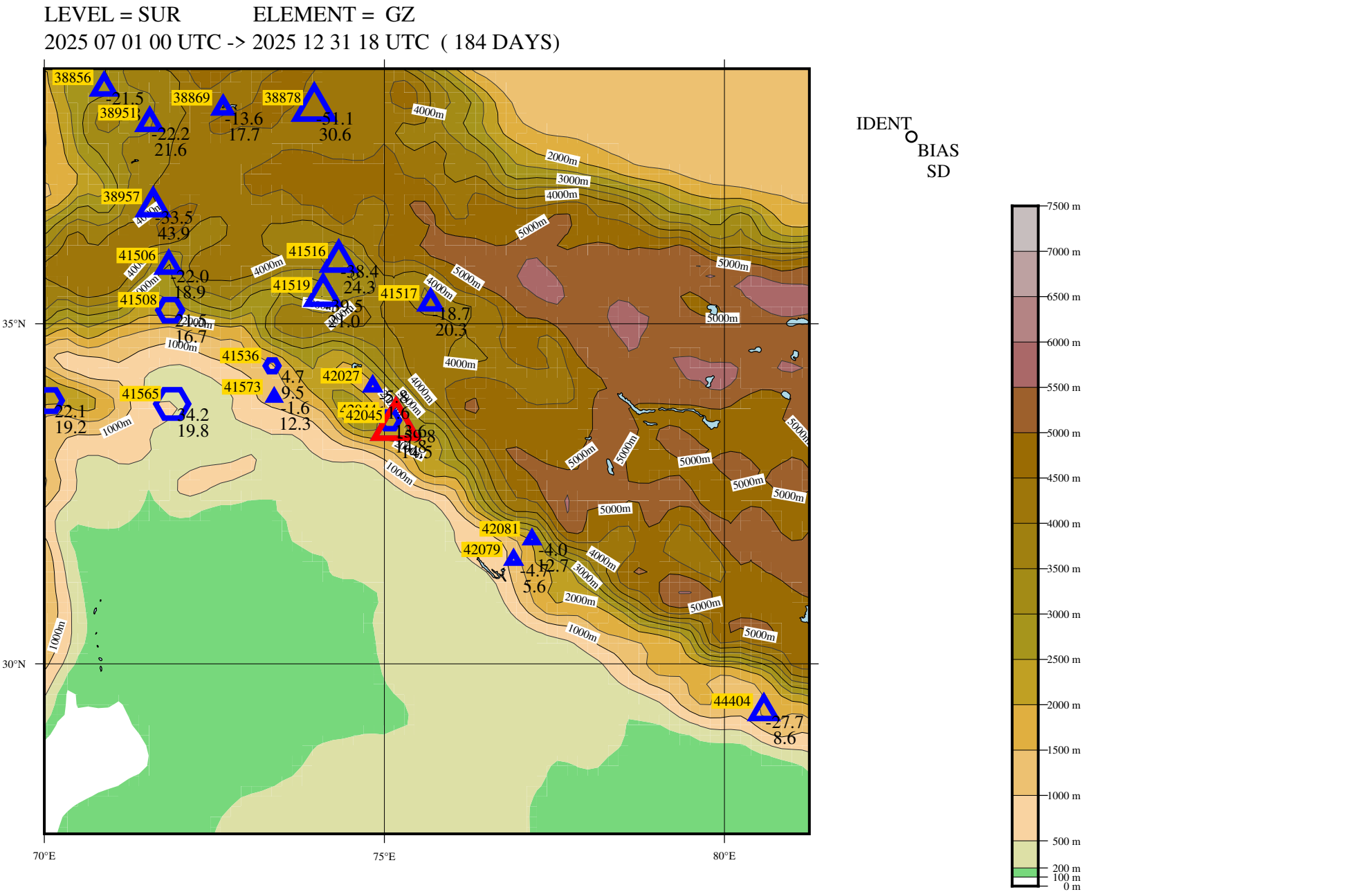

Figure 24 BIAS and SD of GZ for station 42045 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

Figure 25(a) Time-series representation of SLP Obs minus FirstGuess for station 42045

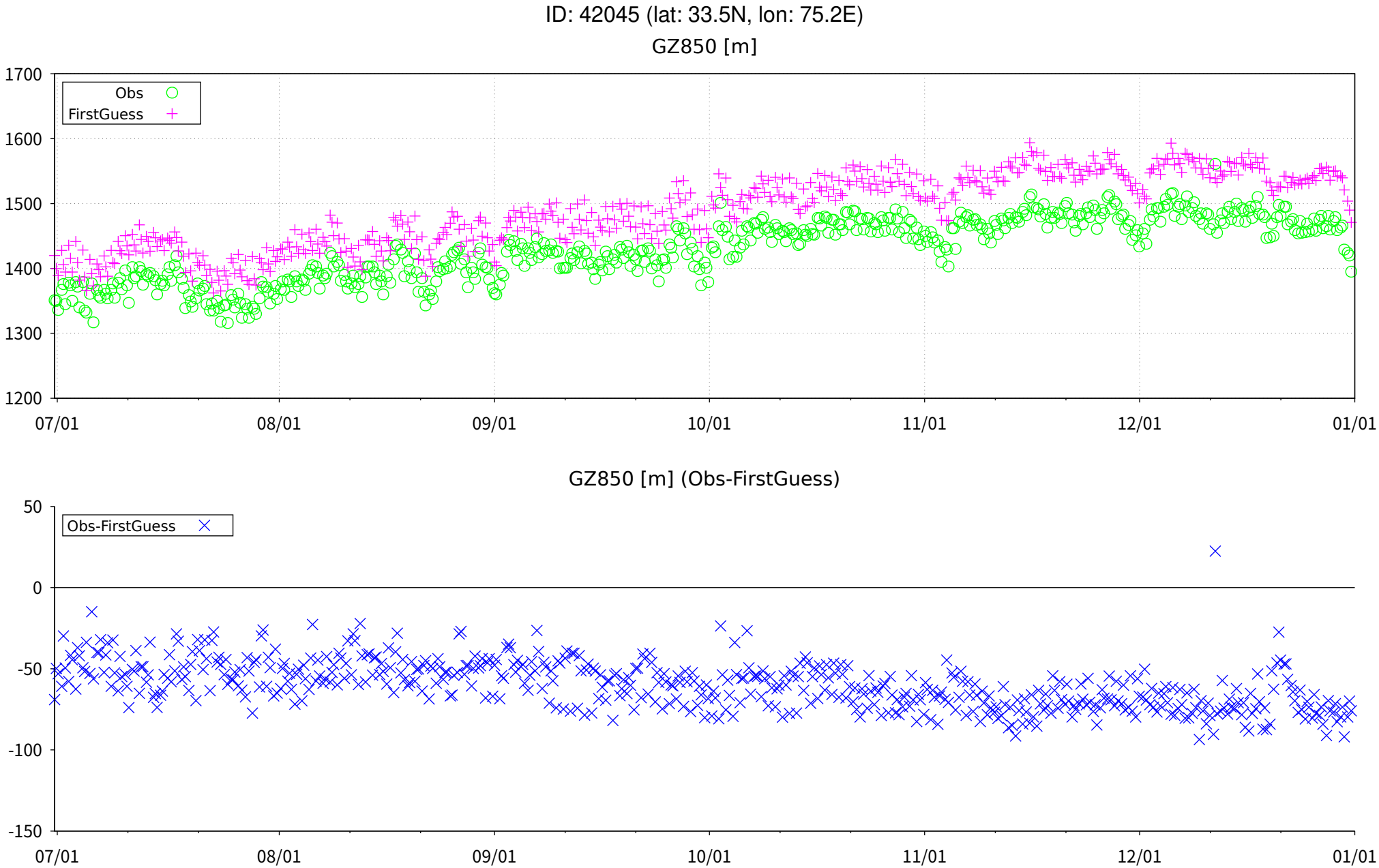

Figure 25(b) Time-series representation of GZ850 Obs minus FirstGuess for station 42045

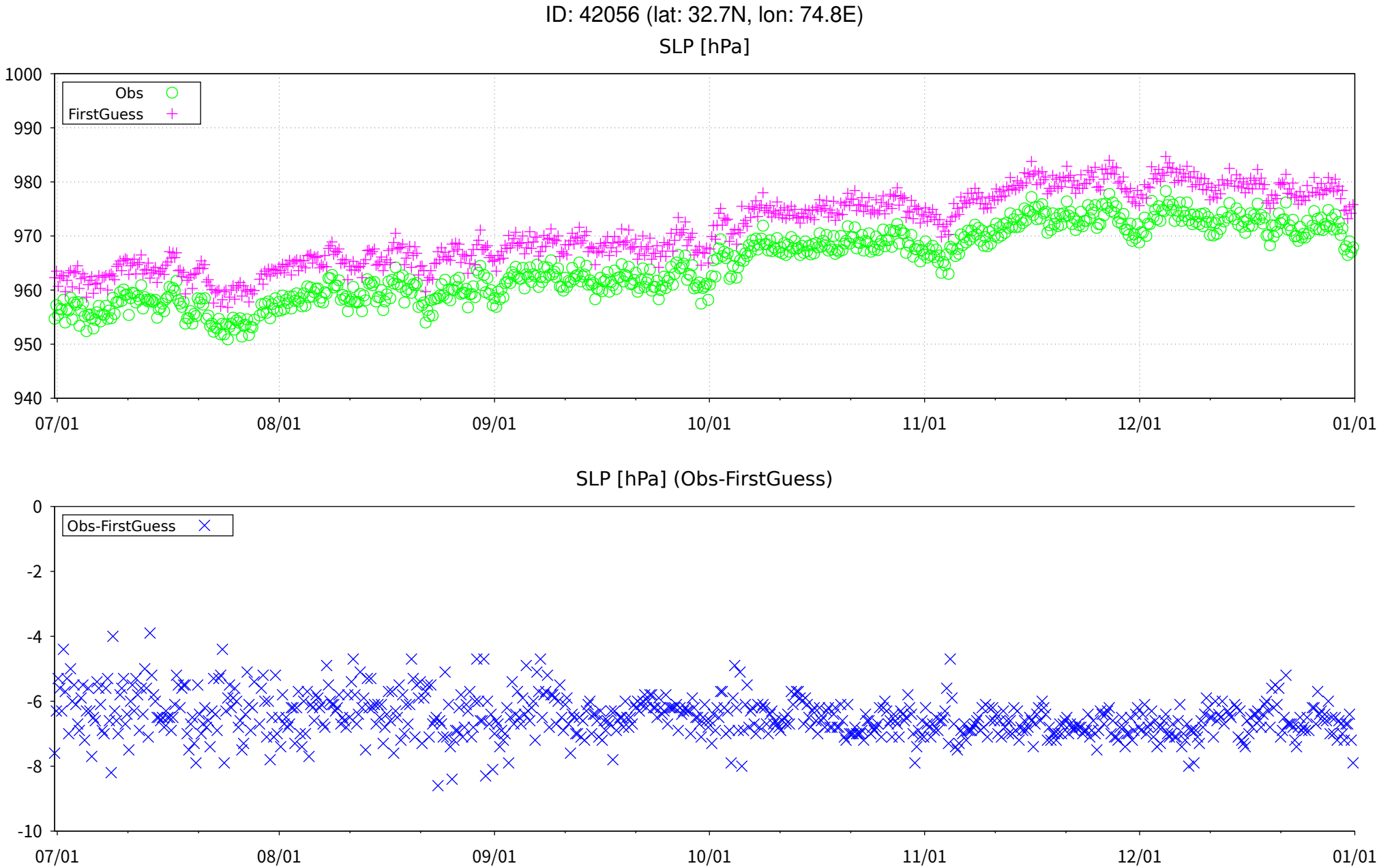

Figure 26 Time-series representation of SLP Obs minus FirstGuess for station 42056

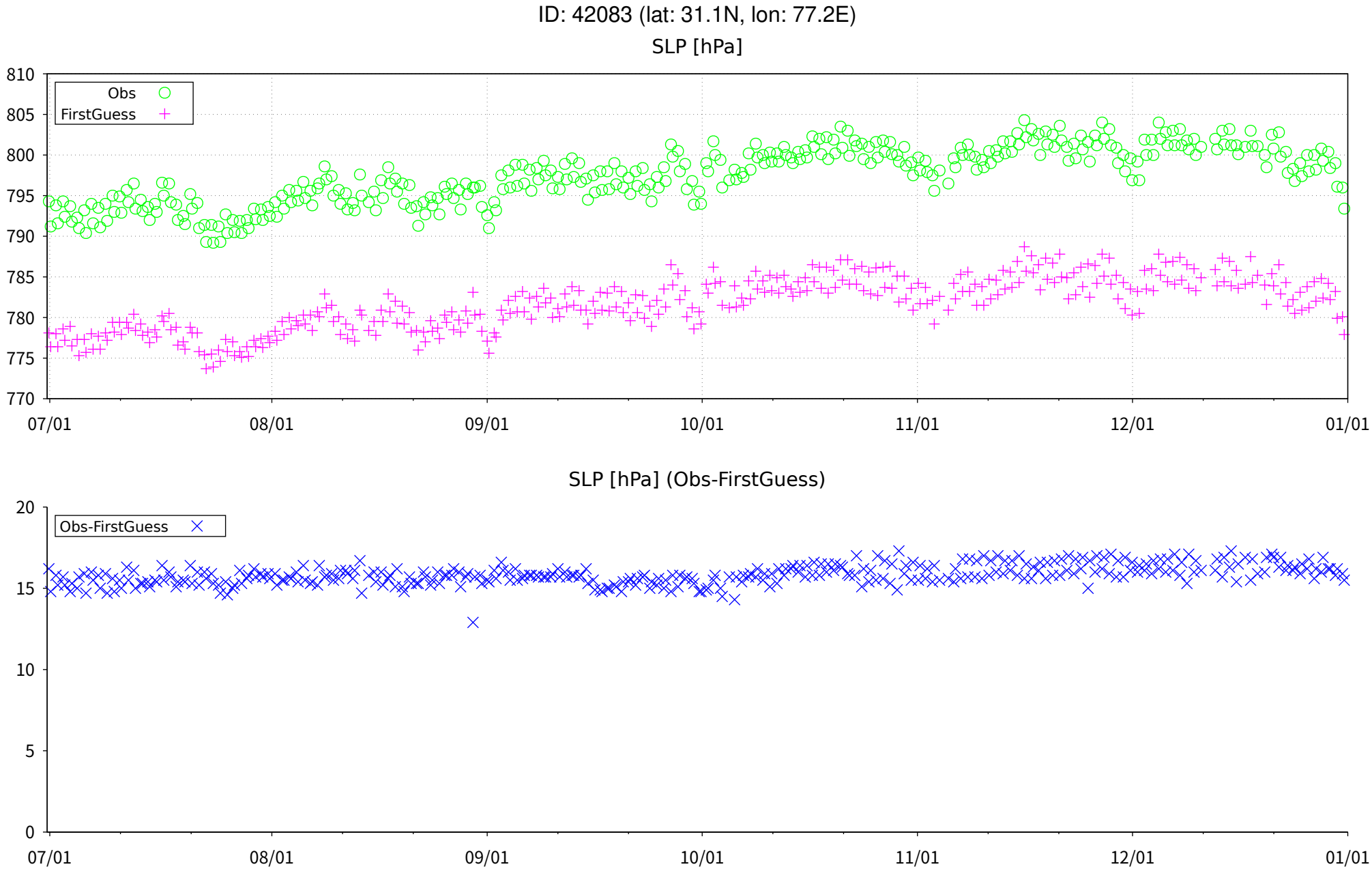

Figure 27 Time-series representation of SLP Obs minus FirstGuess for station 42083

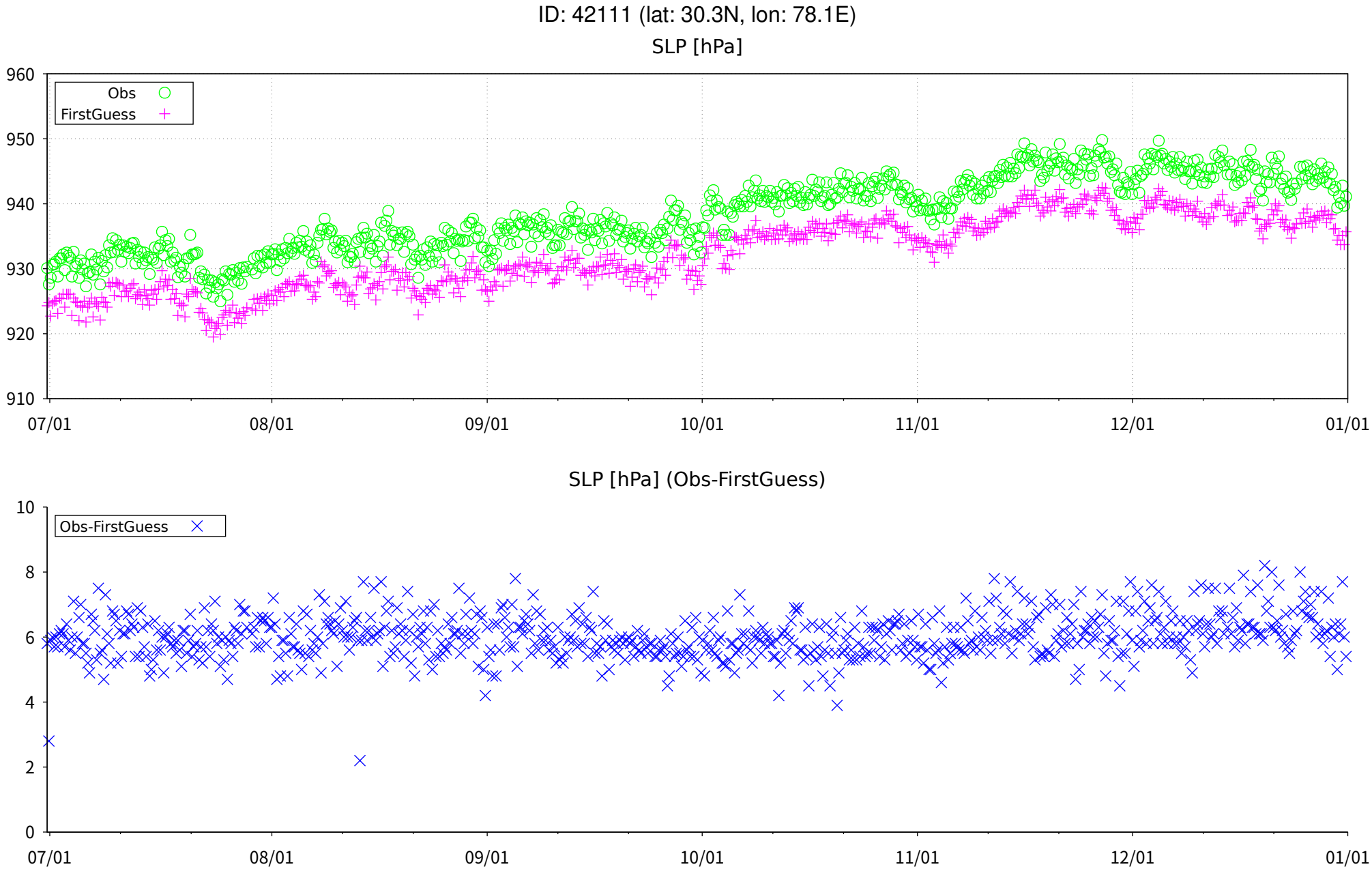

Figure 28 Time-series representation of SLP Obs minus FirstGuess for station 42111

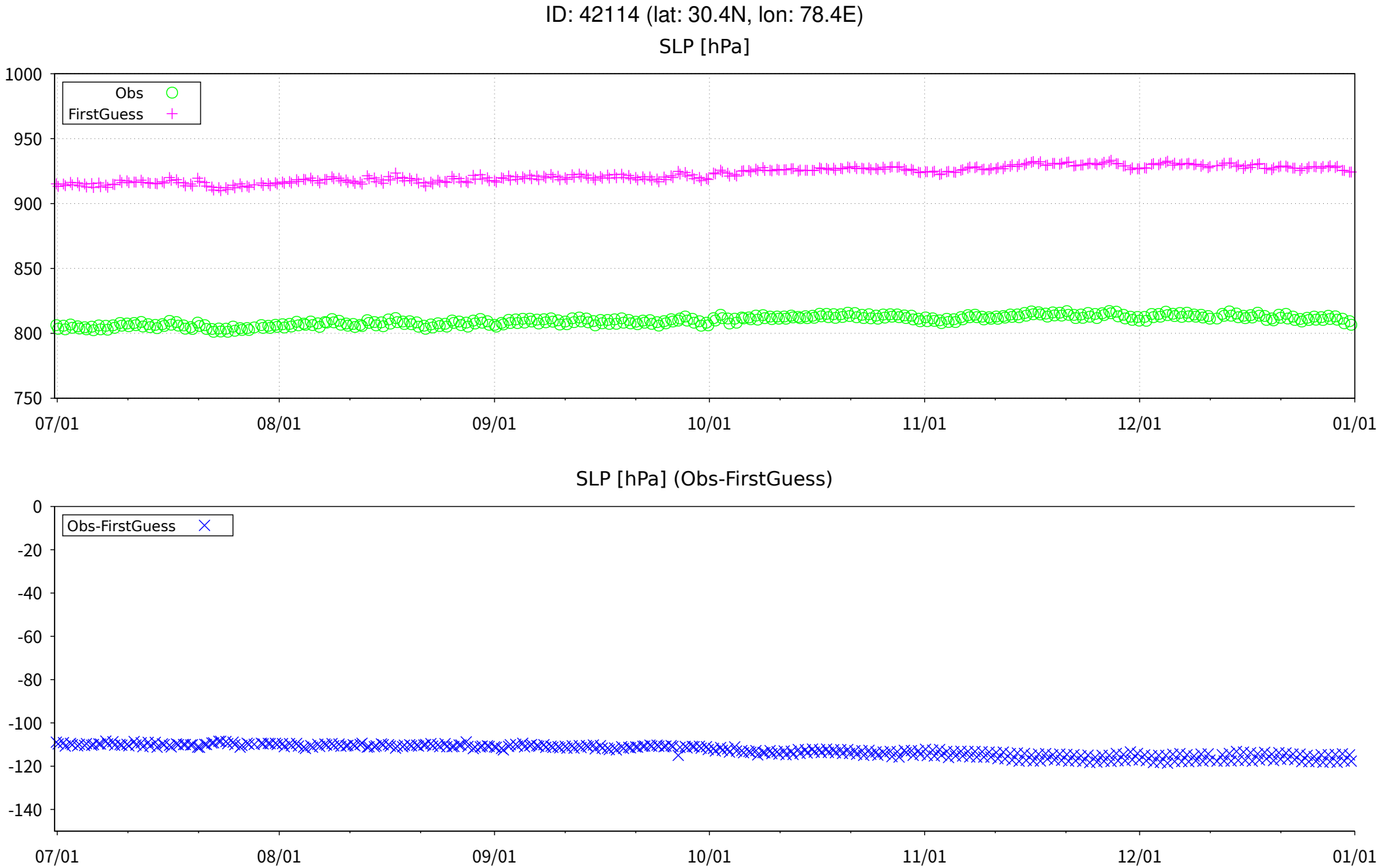

Figure 29 Time-series representation of SLP Obs minus FirstGuess for station 42114

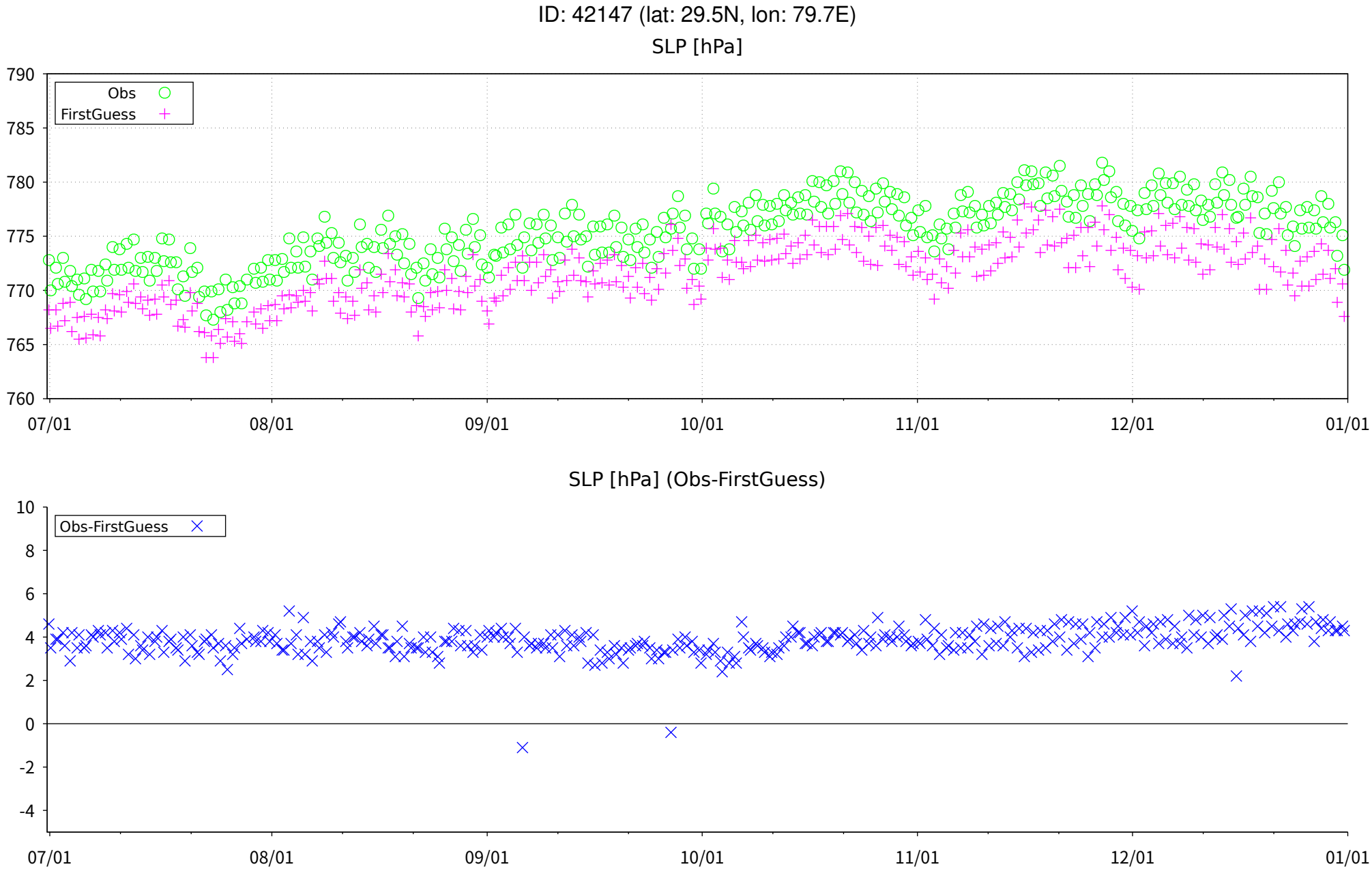

Figure 30 Time-series representation of SLP Obs minus FirstGuess for station 42147

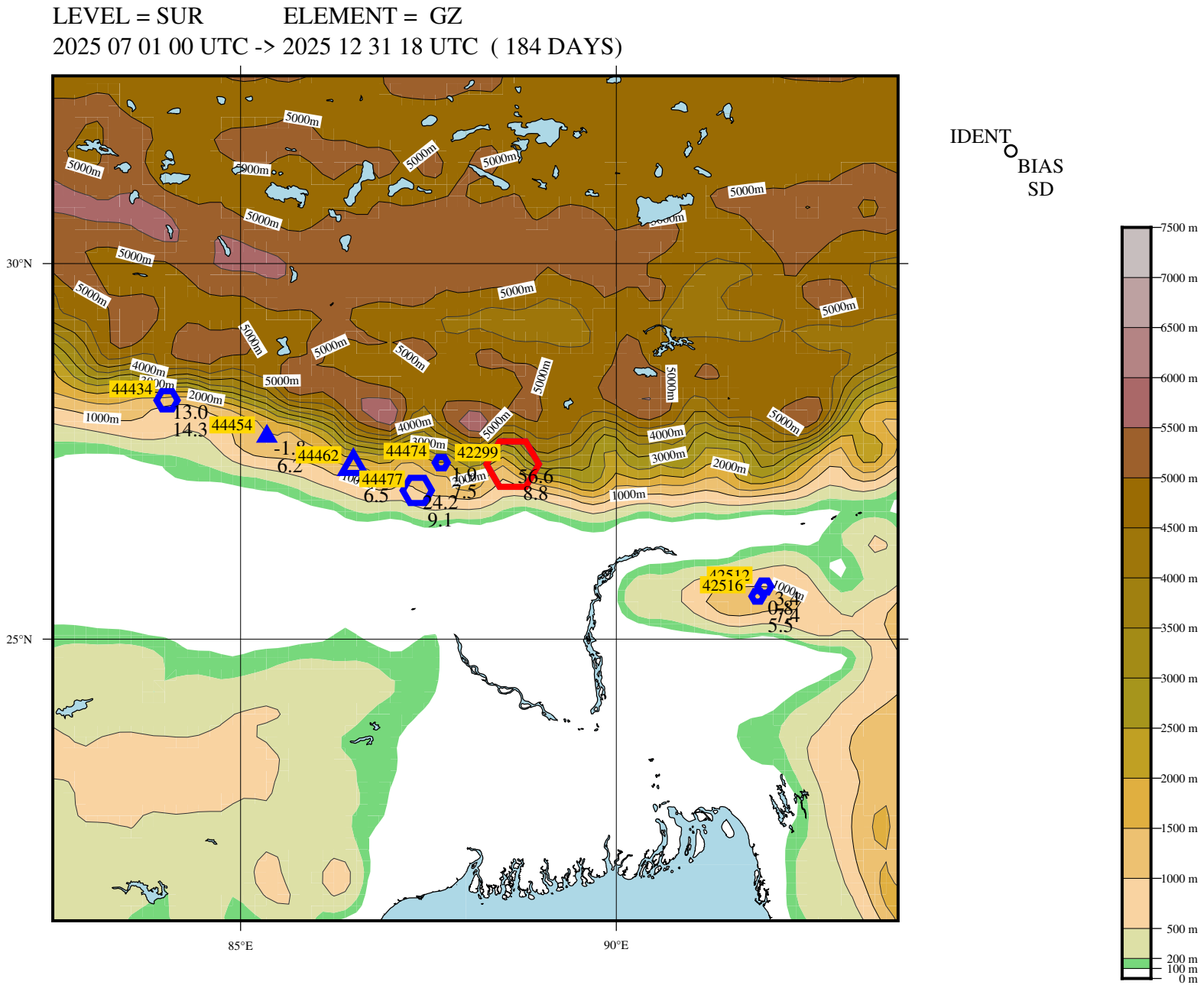

Figure 31 BIAS and SD of GZ for station 42299 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

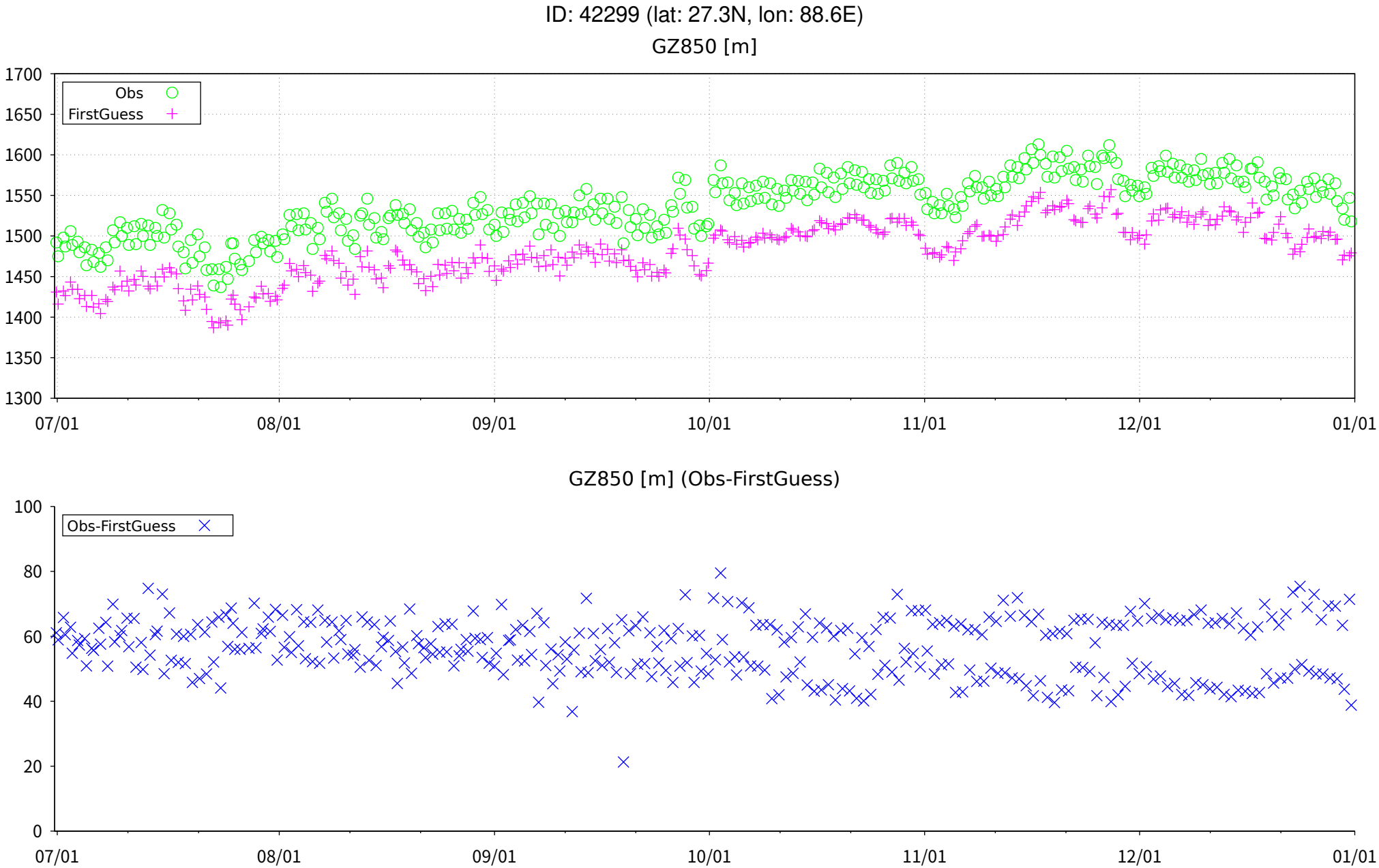

Figure 32 Time-series representation of GZ850 Obs minus FirstGuess for station 42299

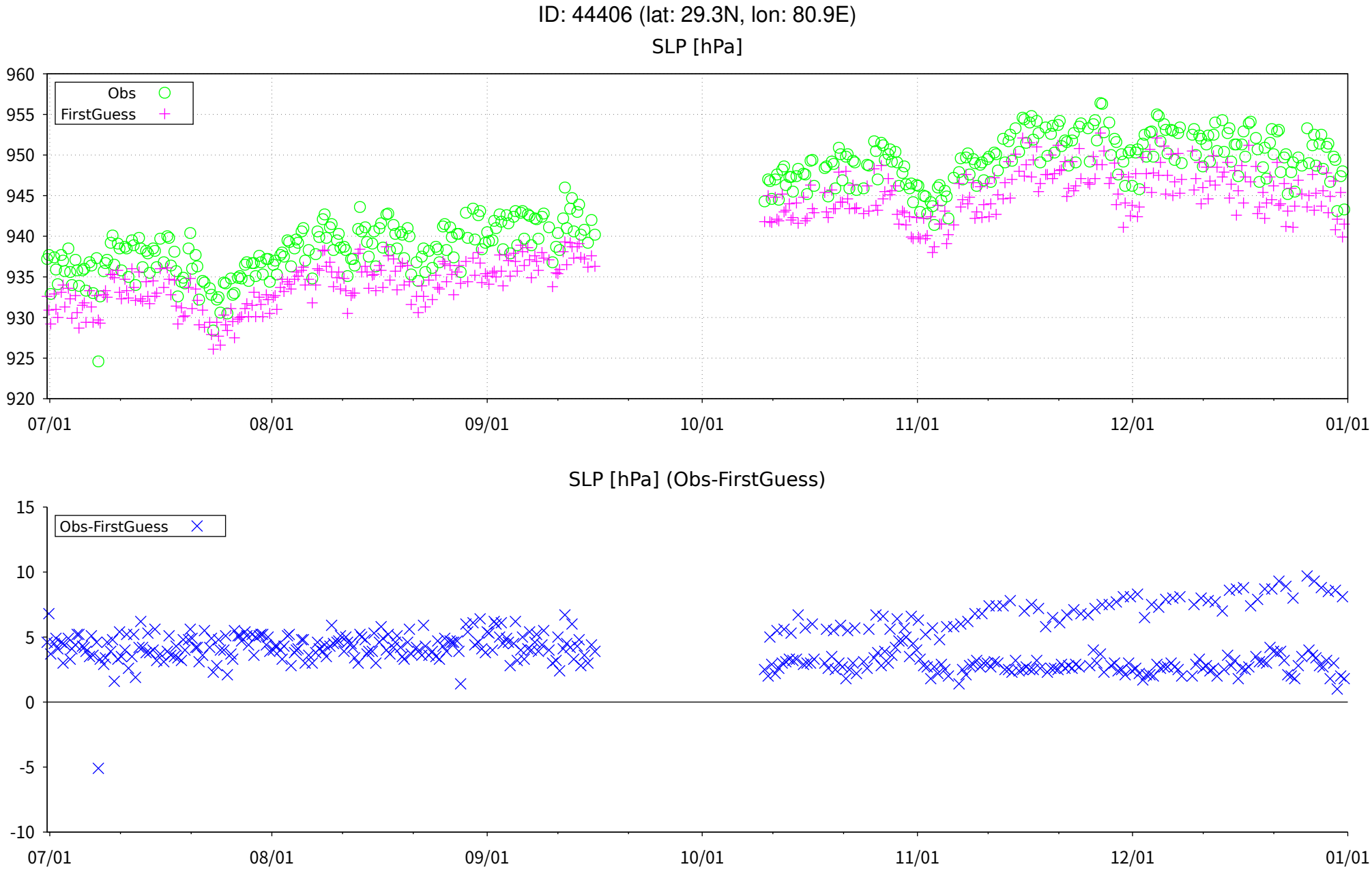

Figure 33 Time-series representation of SLP Obs minus FirstGuess for station 44406

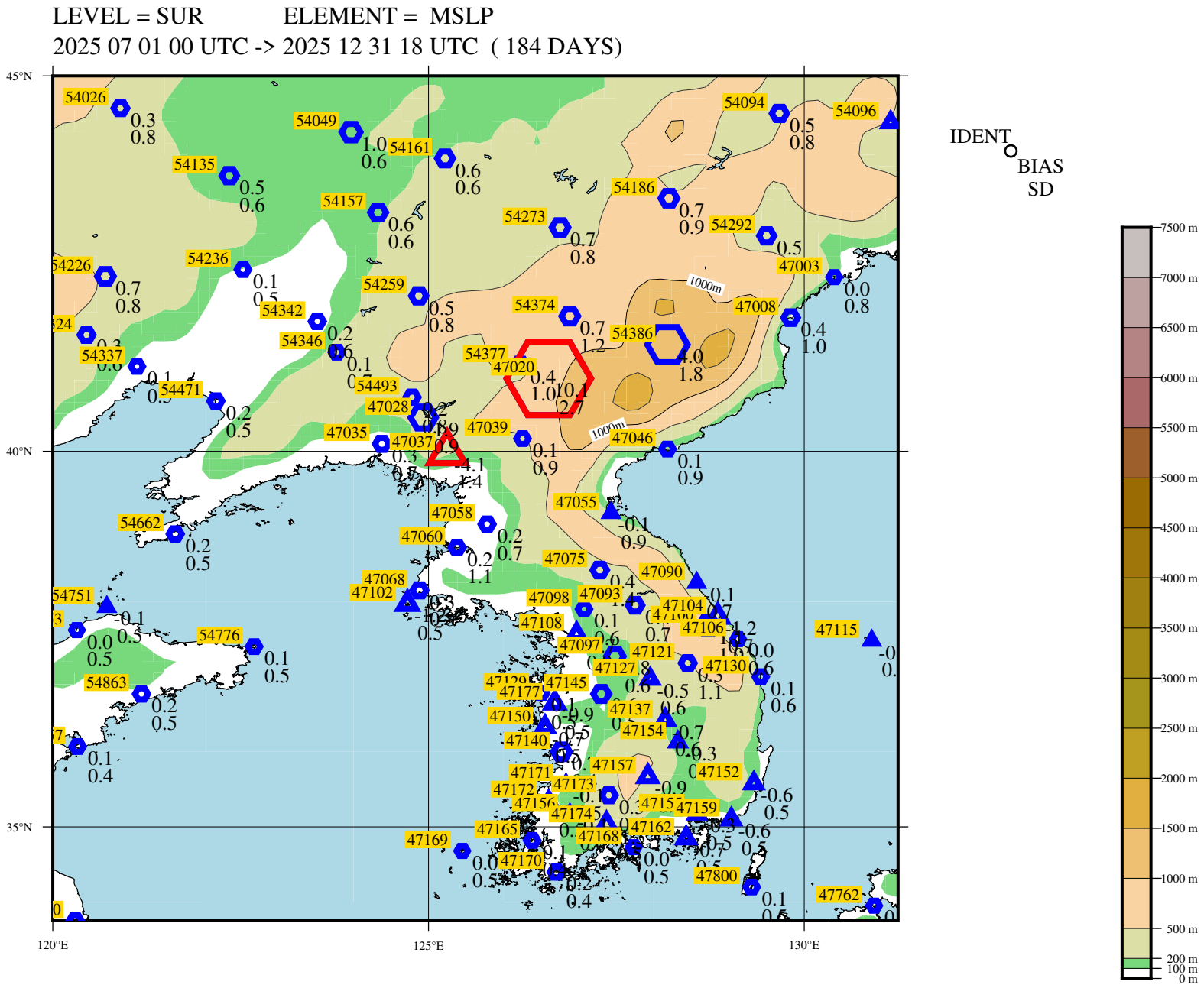

Figure 34 BIAS and SD of MSLP for station 47020, 47037 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

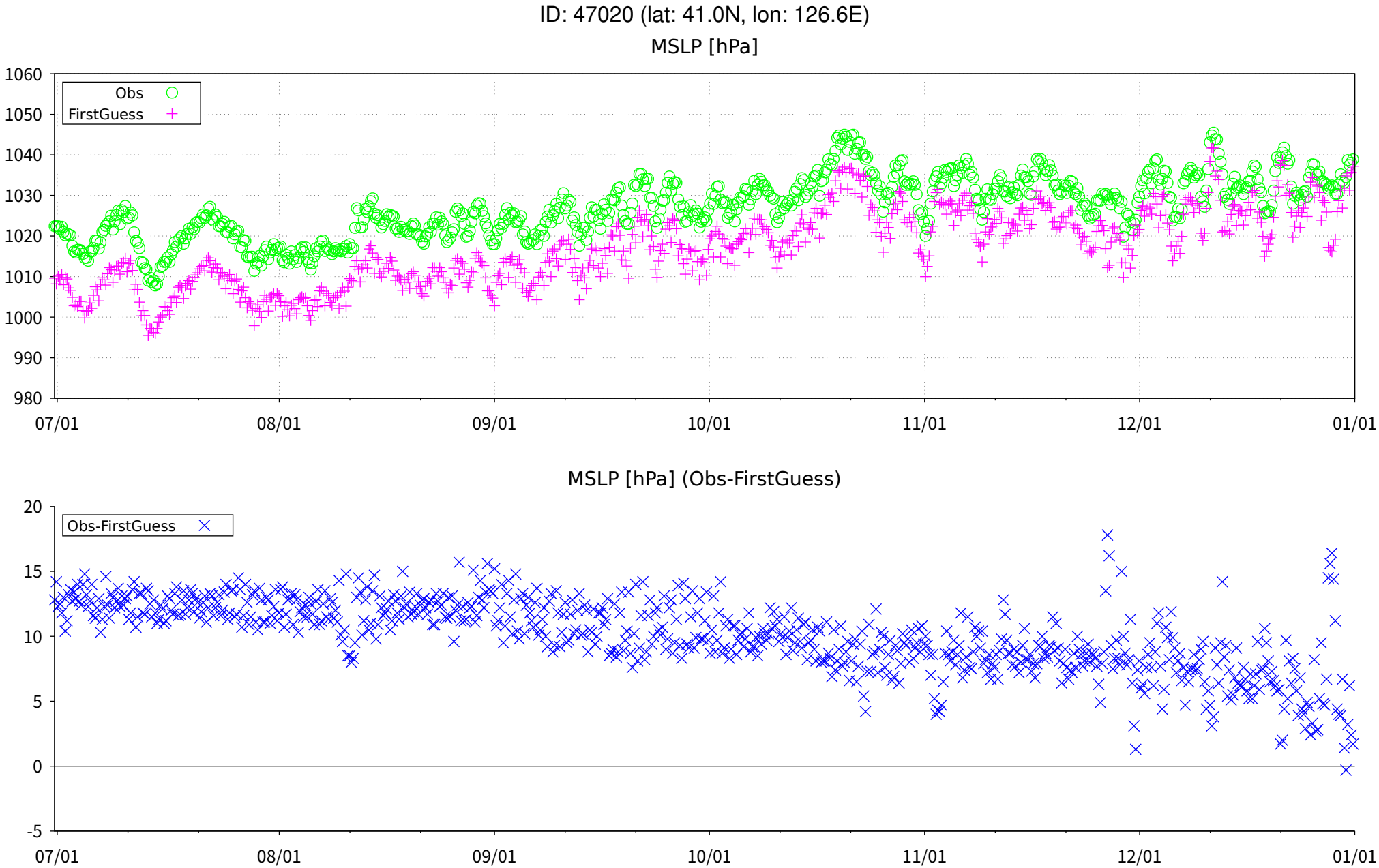

Figure 35 Time-series representation of MSLP Obs minus FirstGuess for station 47020

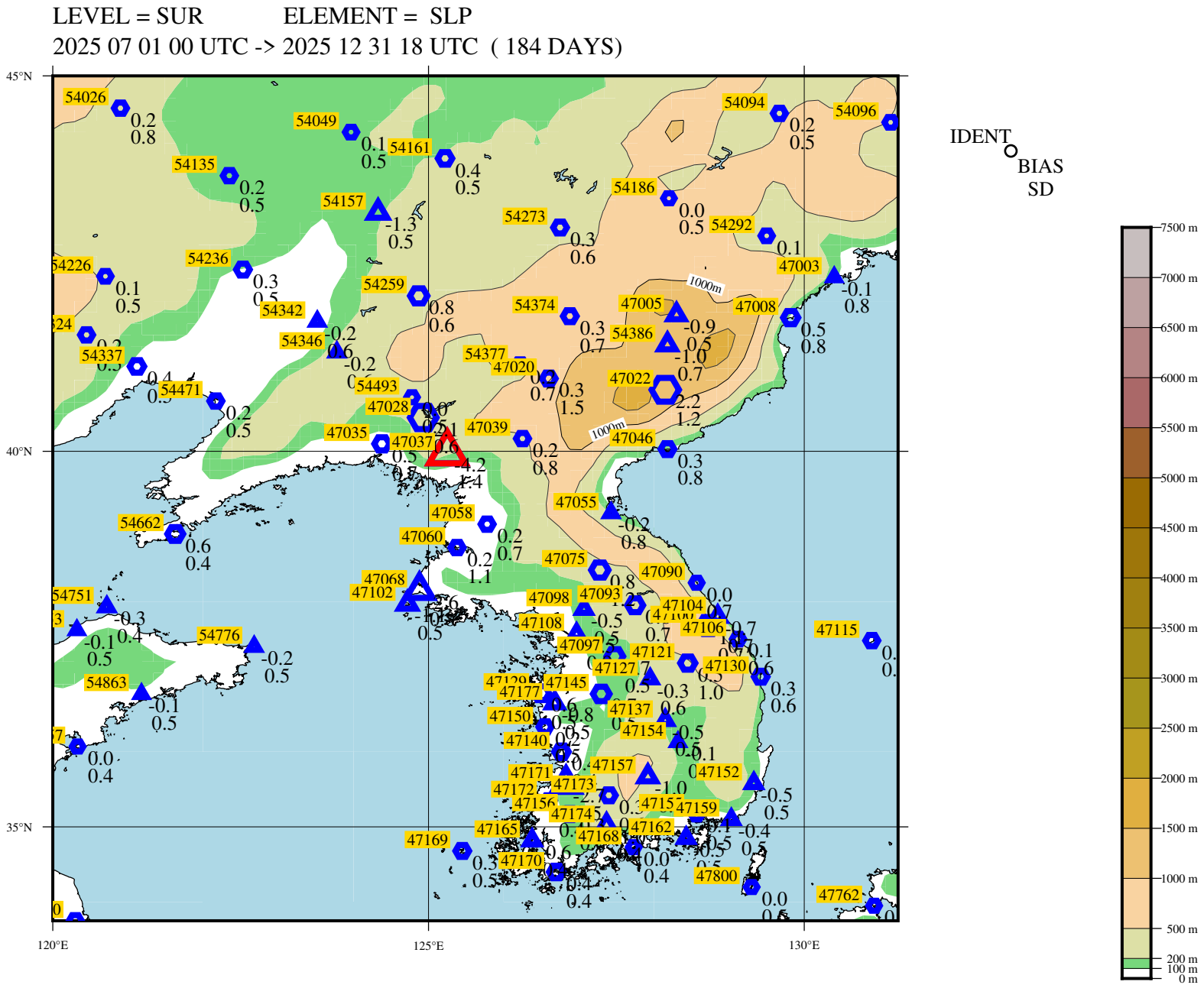

Figure 36 BIAS and SD of SLP for station 47037 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

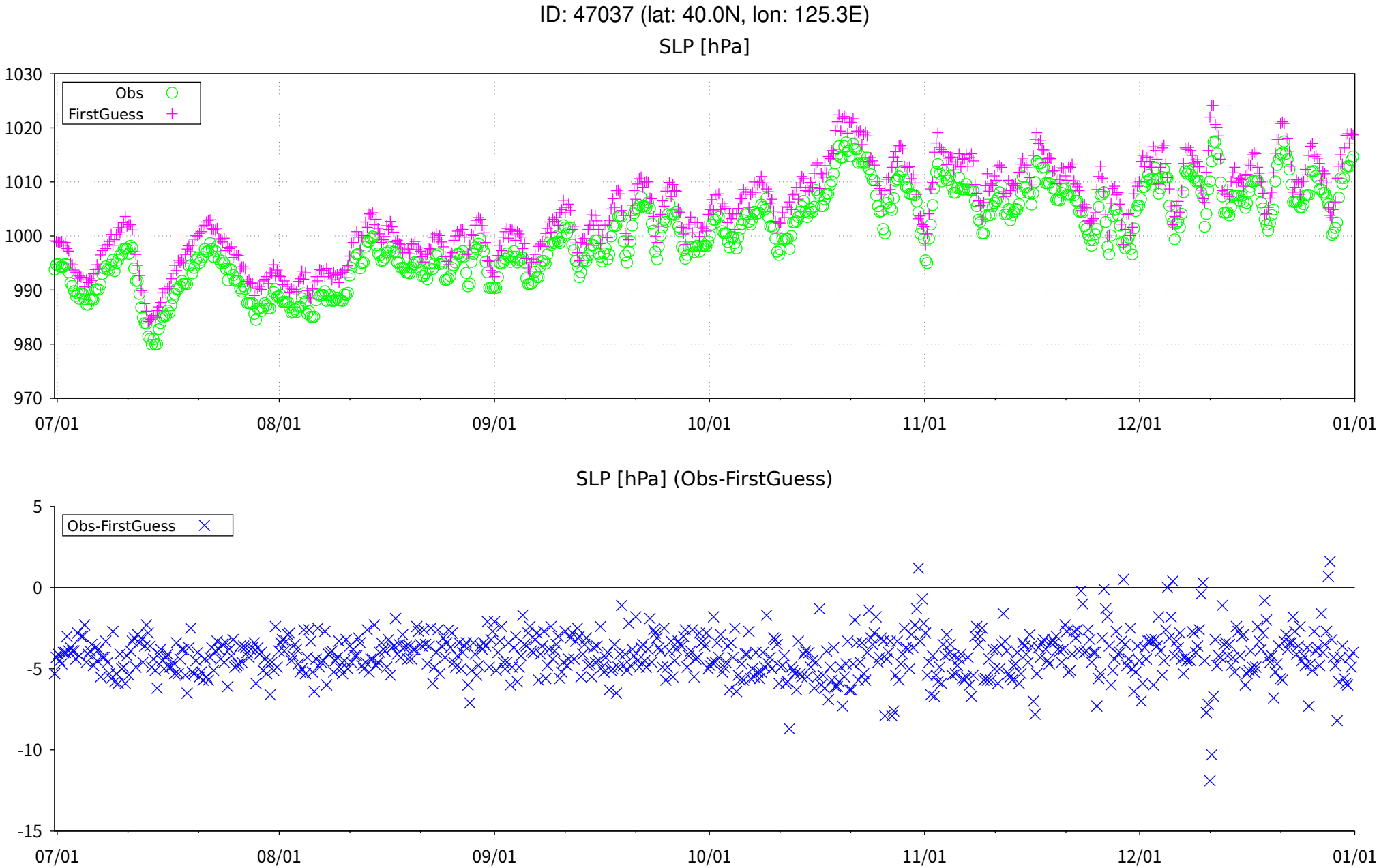

Figure 37(a) Time-series representation of SLP Obs minus FirstGuess for station 47037

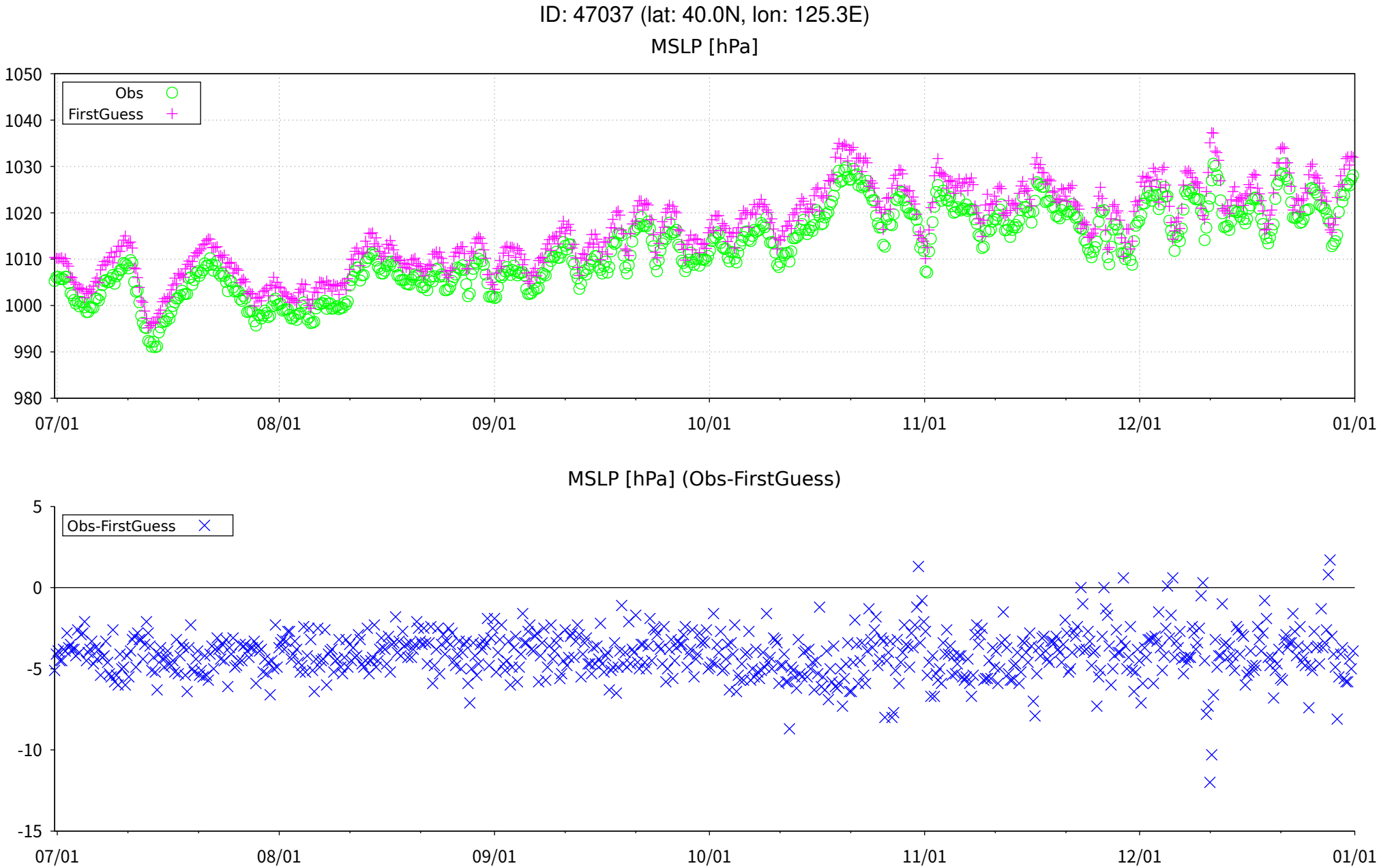

Figure 37(b) Time-series representation of MSLP Obs minus FirstGuess for station 47037

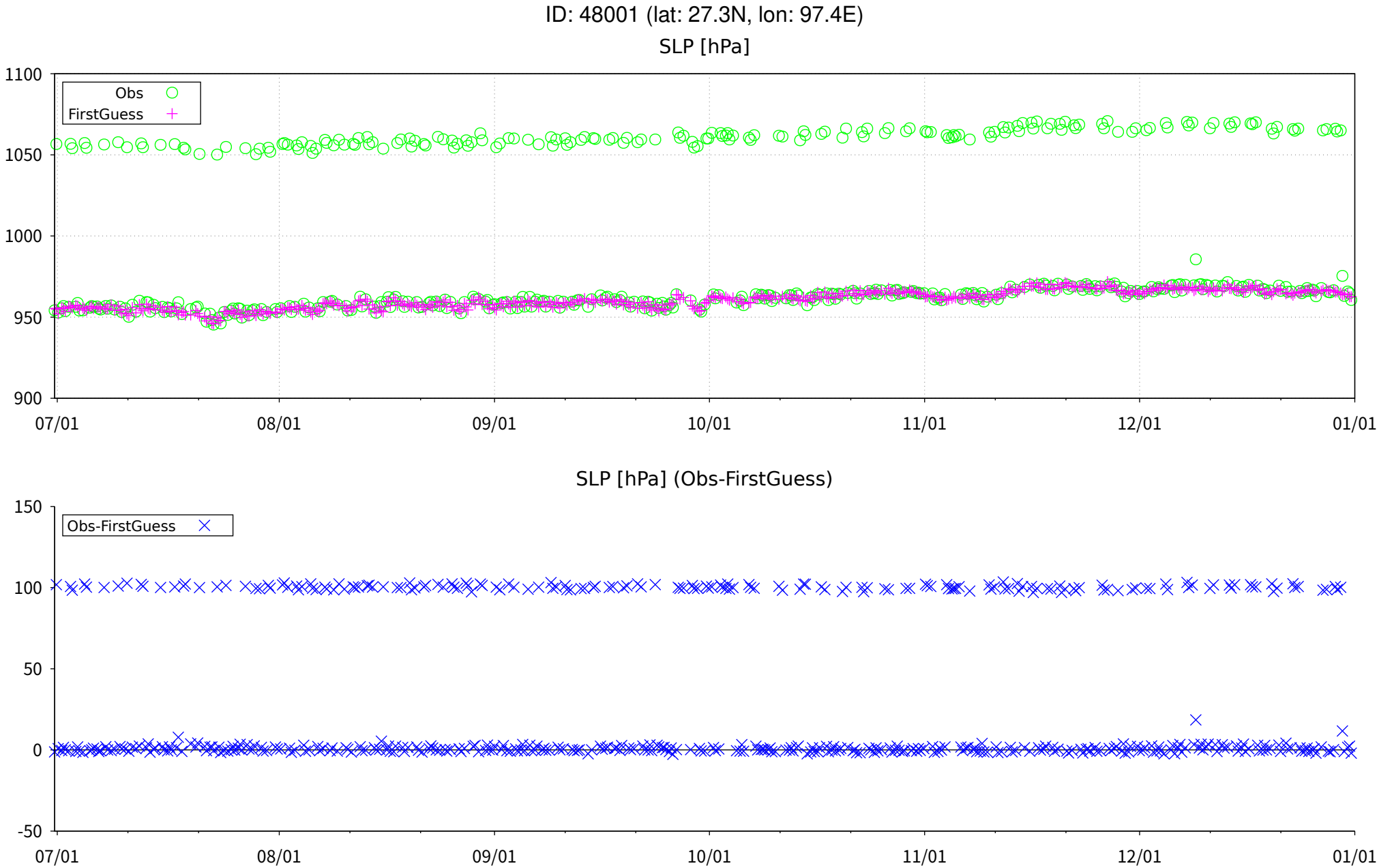

Figure 38 Time-series representation of SLP Obs minus FirstGuess for station 48001

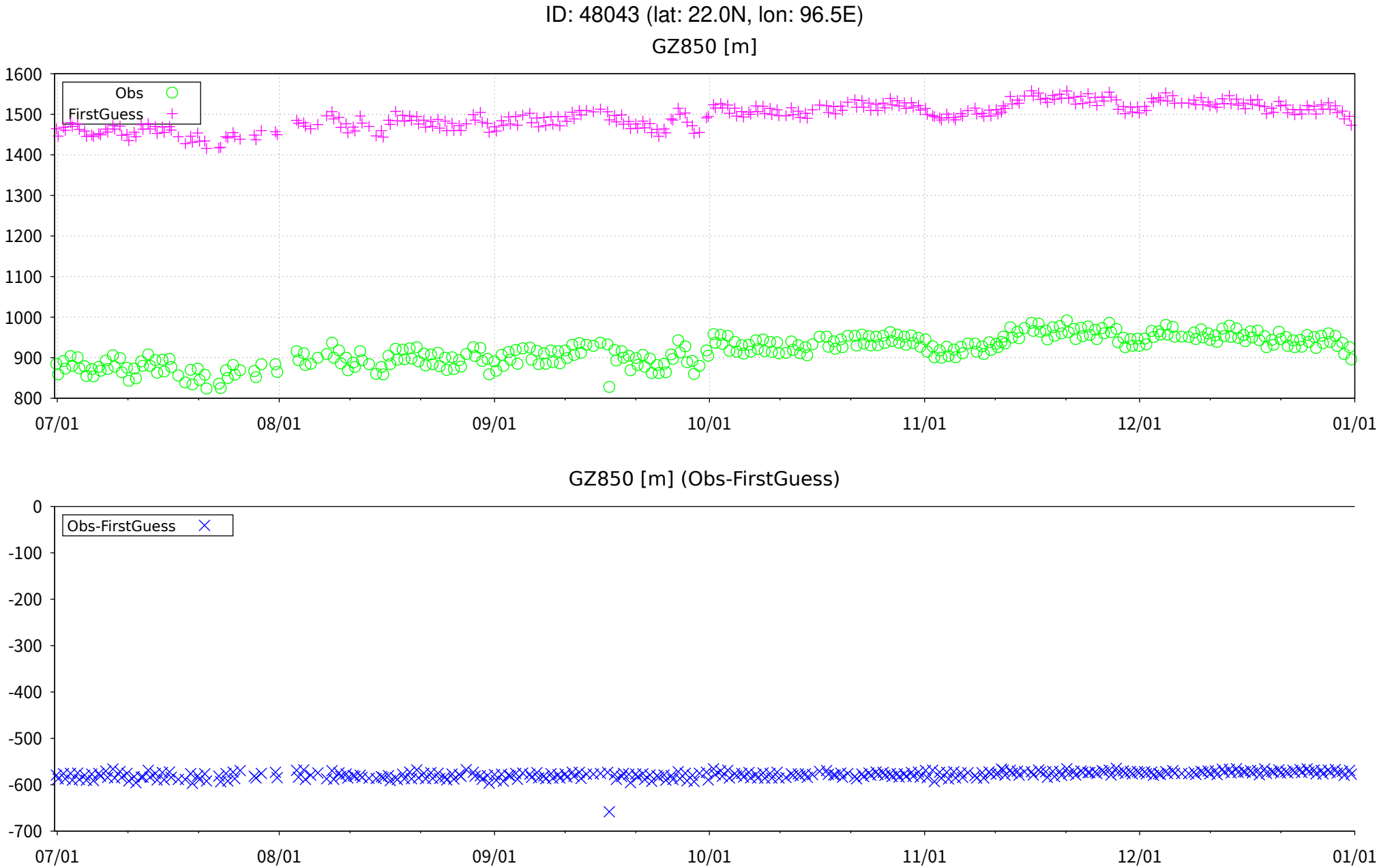

Figure 39 Time-series representation of GZ850 Obs minus FirstGuess for station 48043

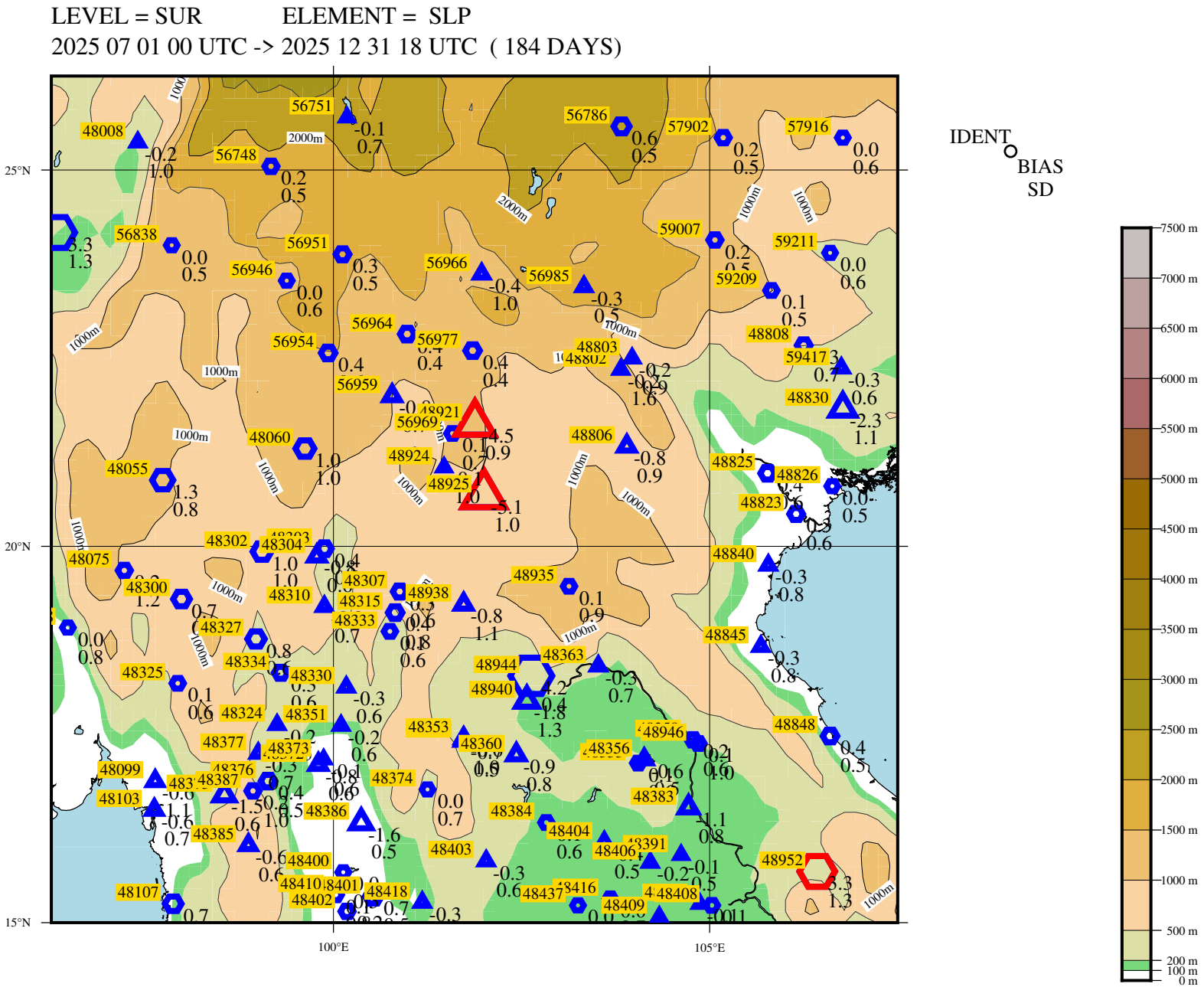

Figure 40 BIAS and SD of SLP for station 48921, 48925, 48952 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

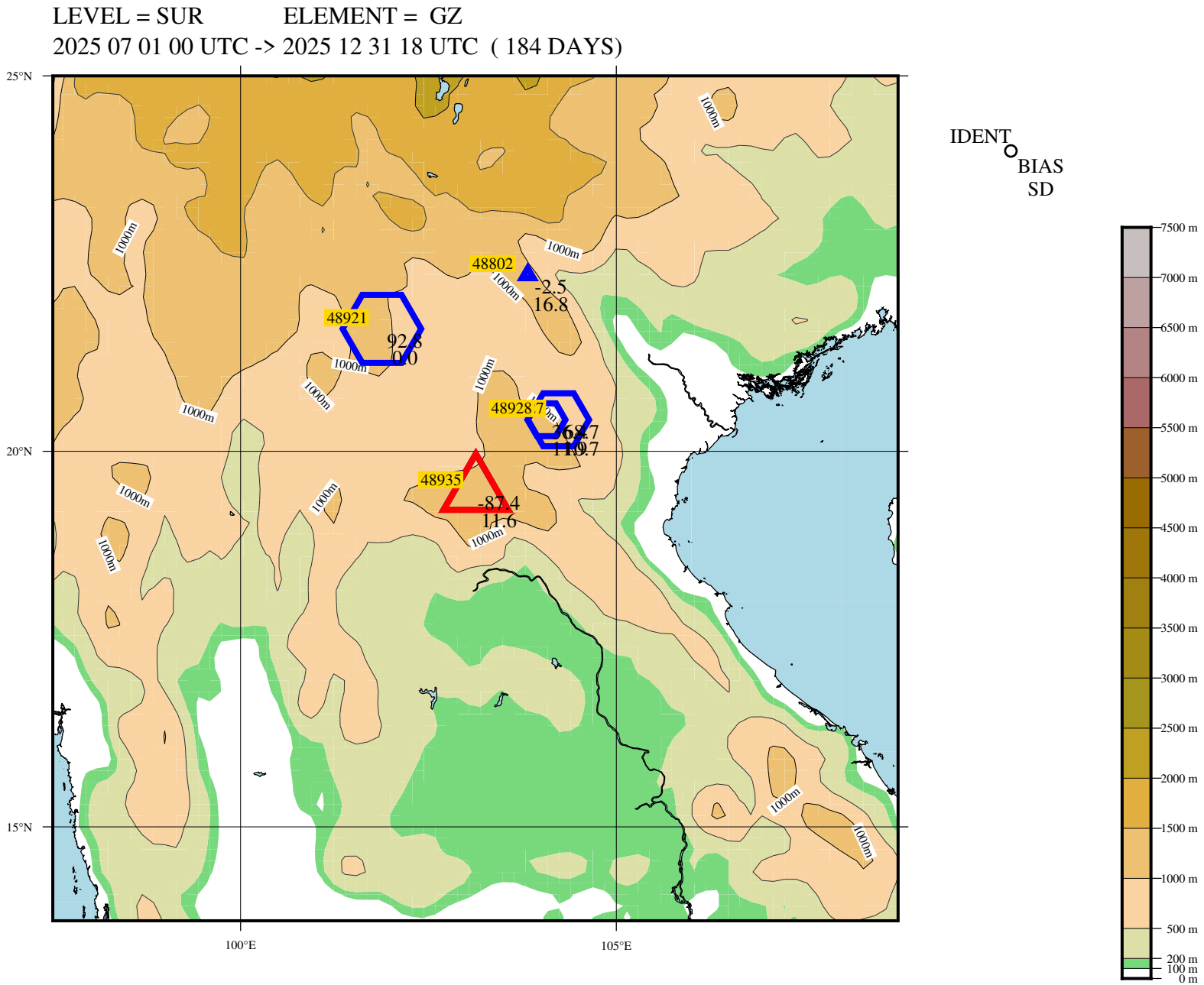

Figure 41 BIAS and SD of GZ for station 48935 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

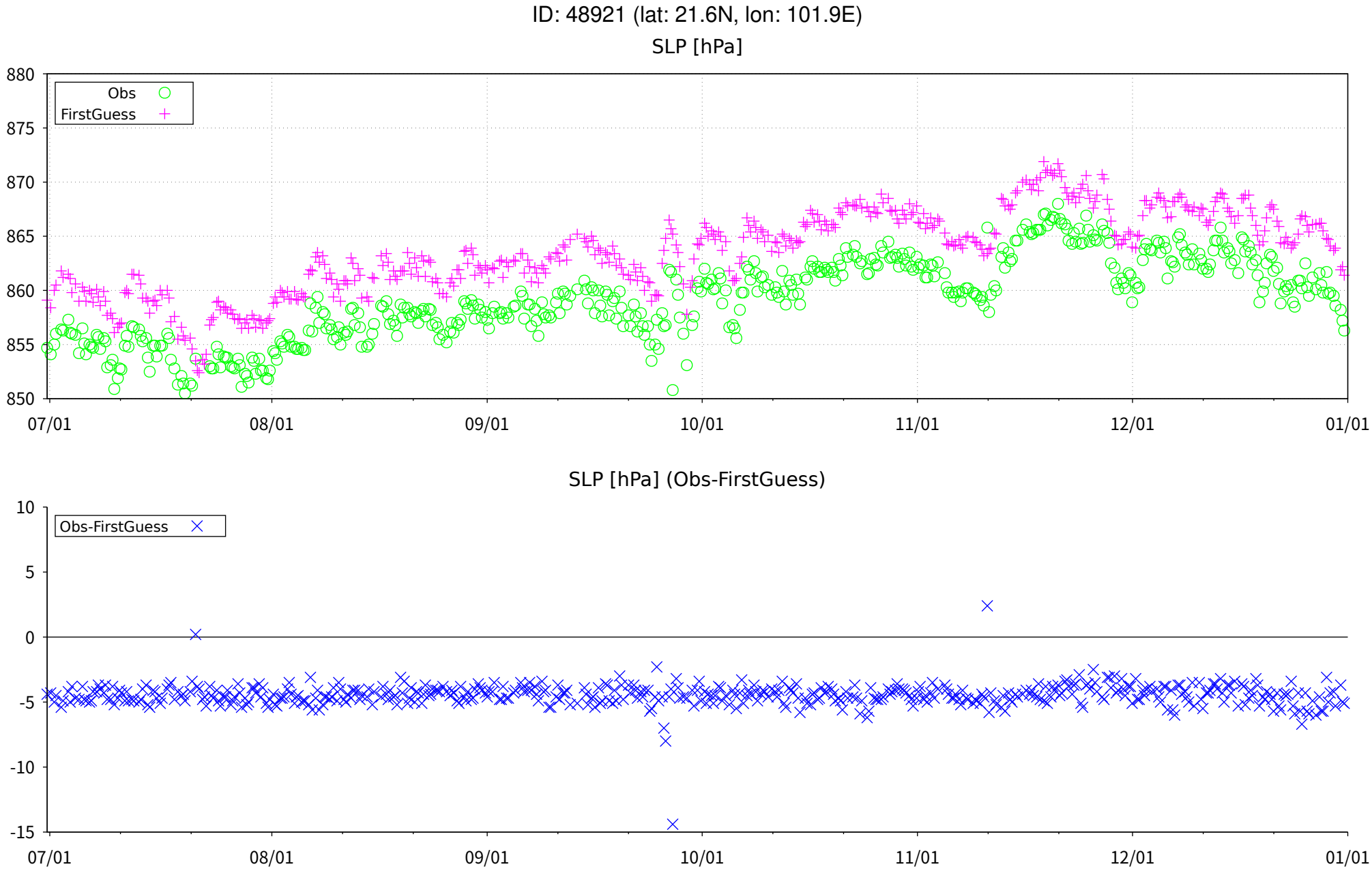

Figure 42(a) Time-series representation of SLP Obs minus FirstGuess for station 48921

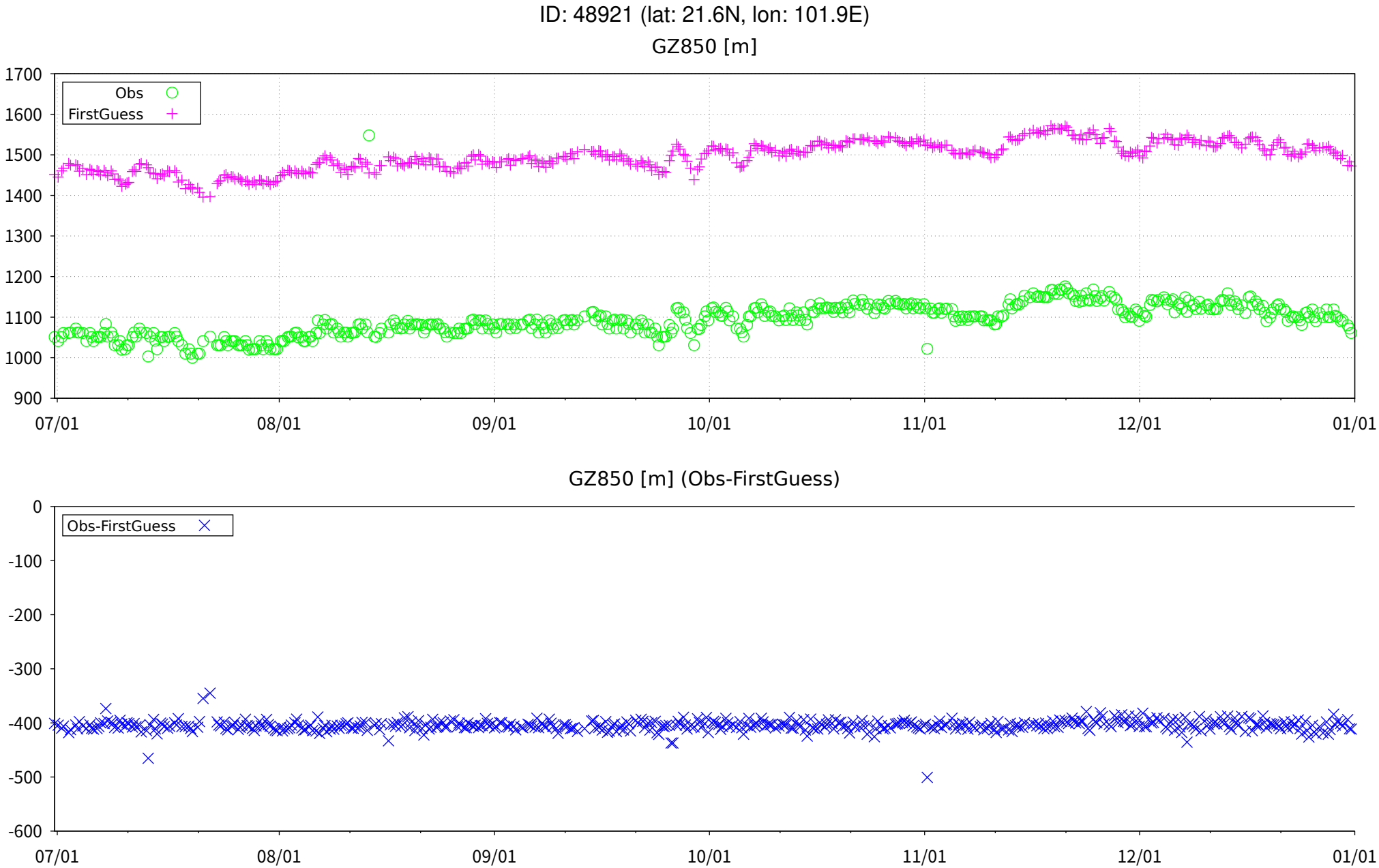

Figure 42(b) Time-series representation of GZ850 Obs minus FirstGuess for station 48921

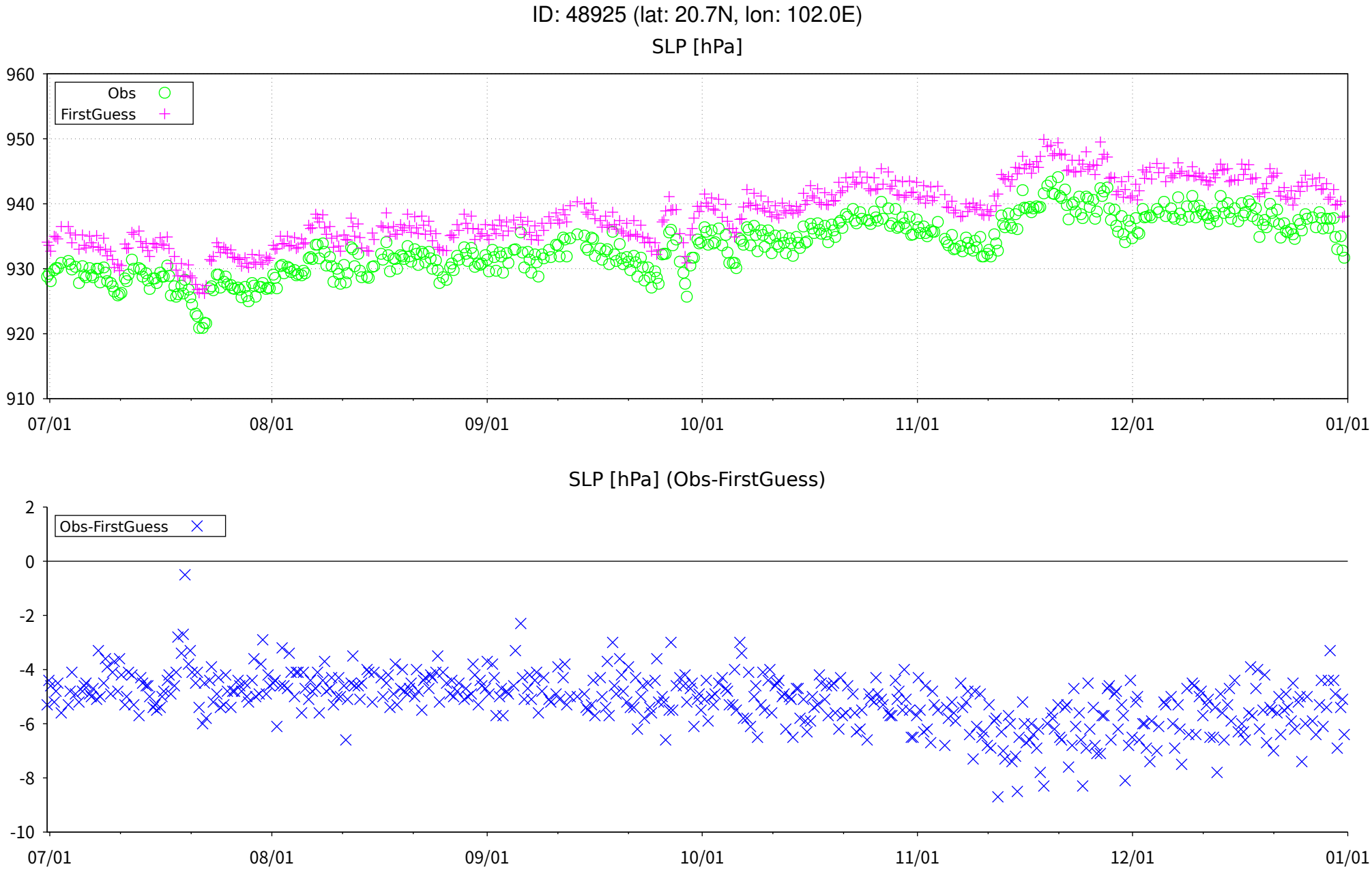

Figure 43 Time-series representation of SLP Obs minus FirstGuess for station 48925

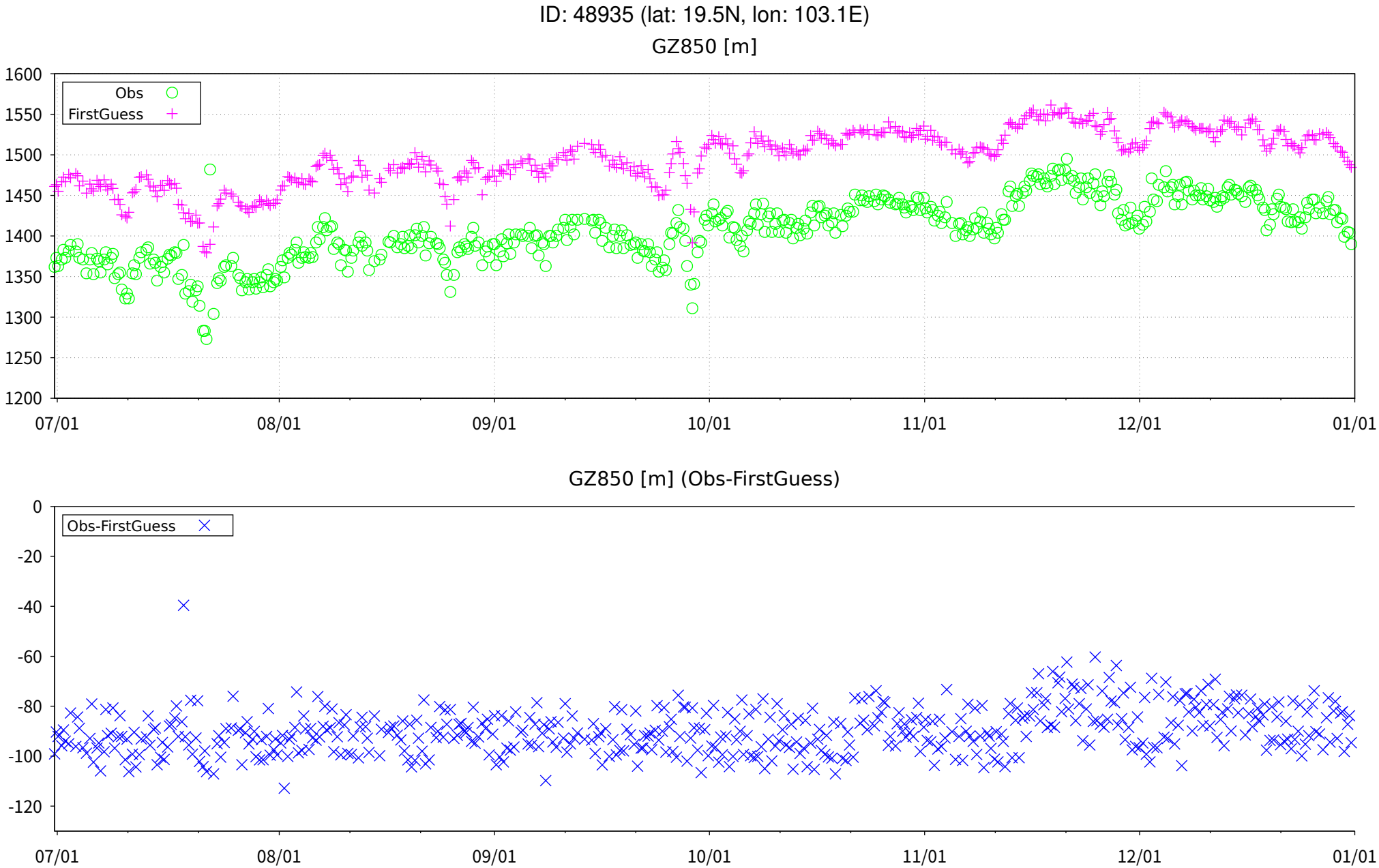

Figure 44 Time-series representation of GZ850 Obs minus FirstGuess for station 48935

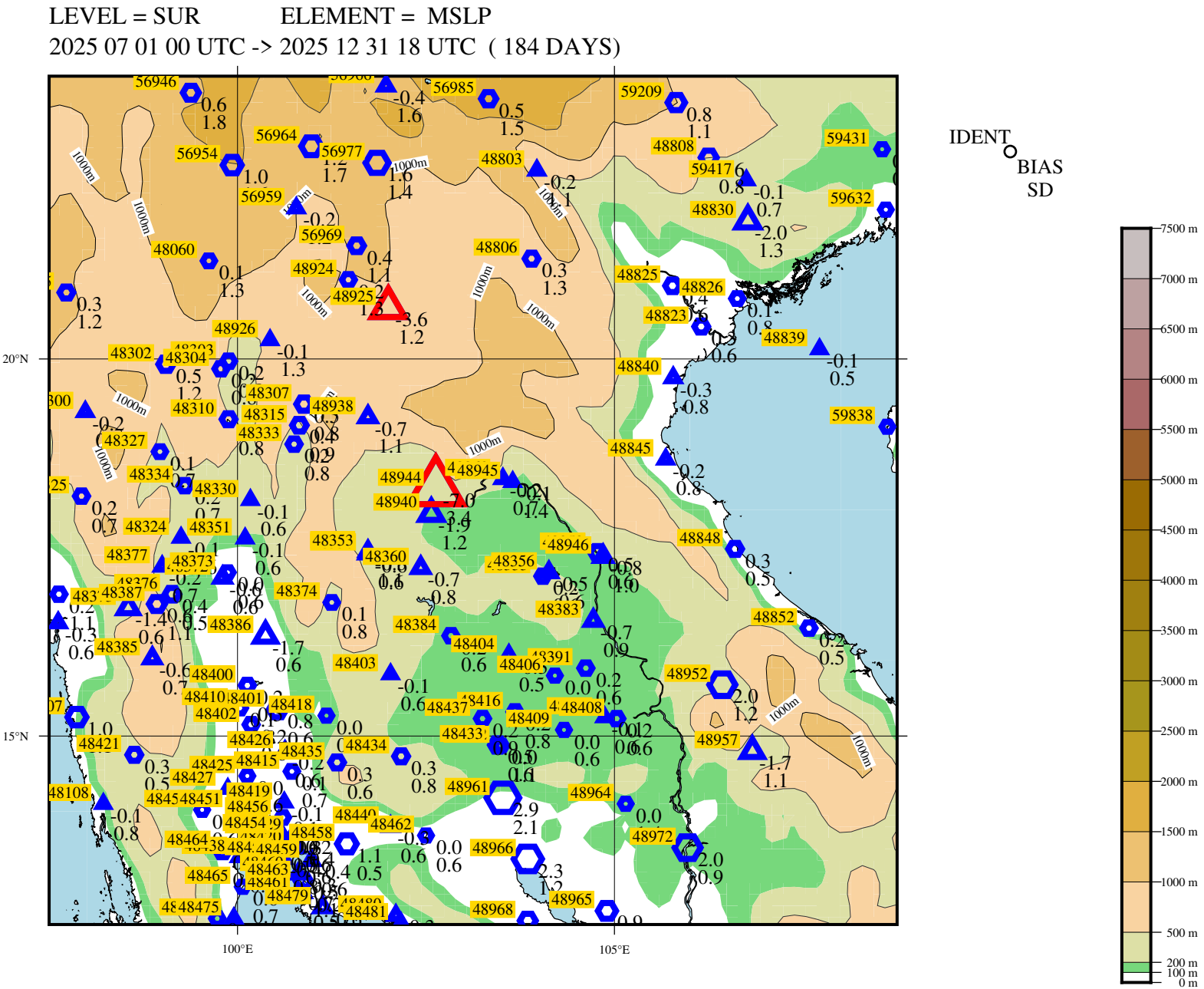

Figure 45 BIAS and SD of MSLP for station 48925, 48944 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

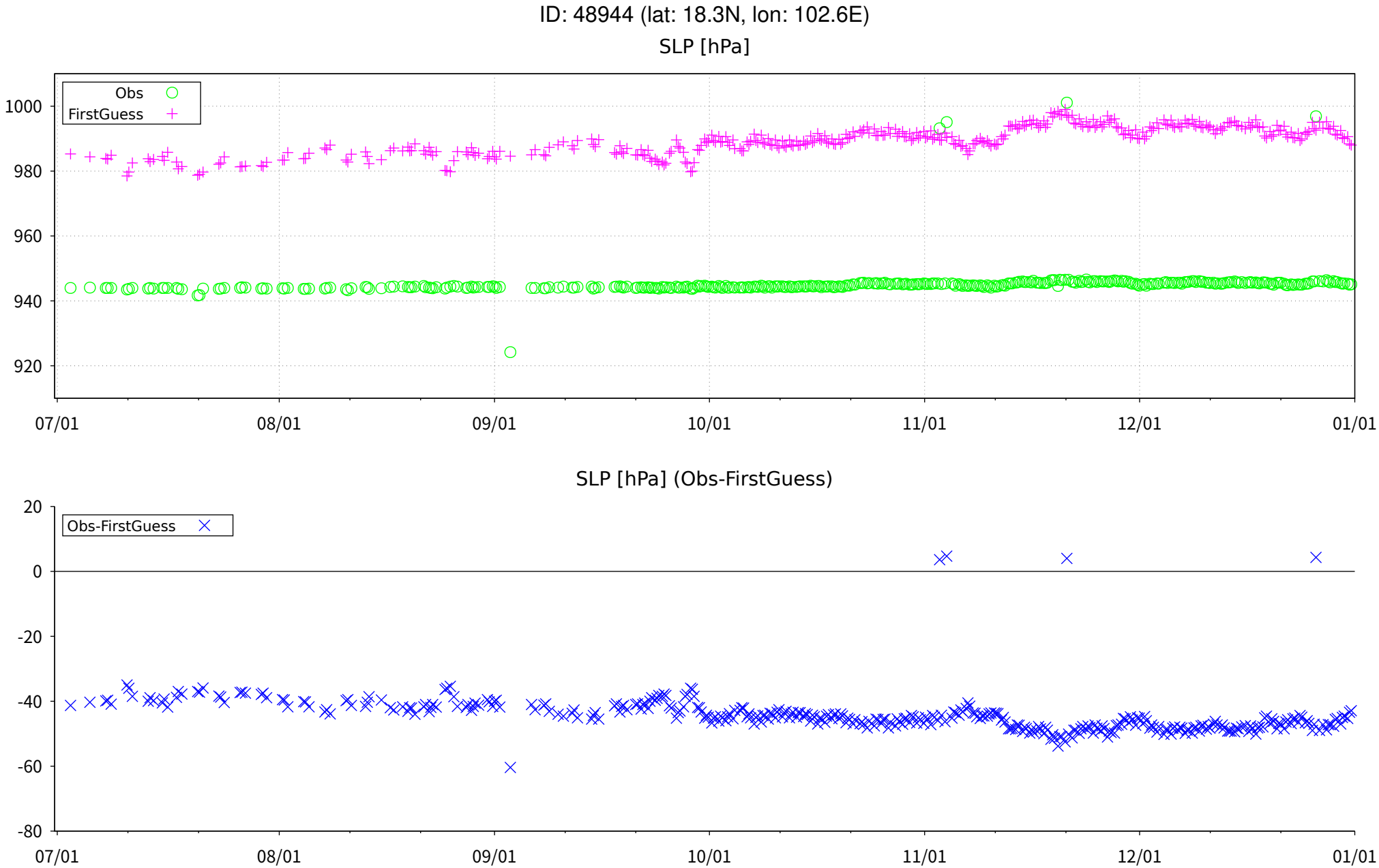

Figure 46(a) Time-series representation of SLP Obs minus FirstGuess for station 48944

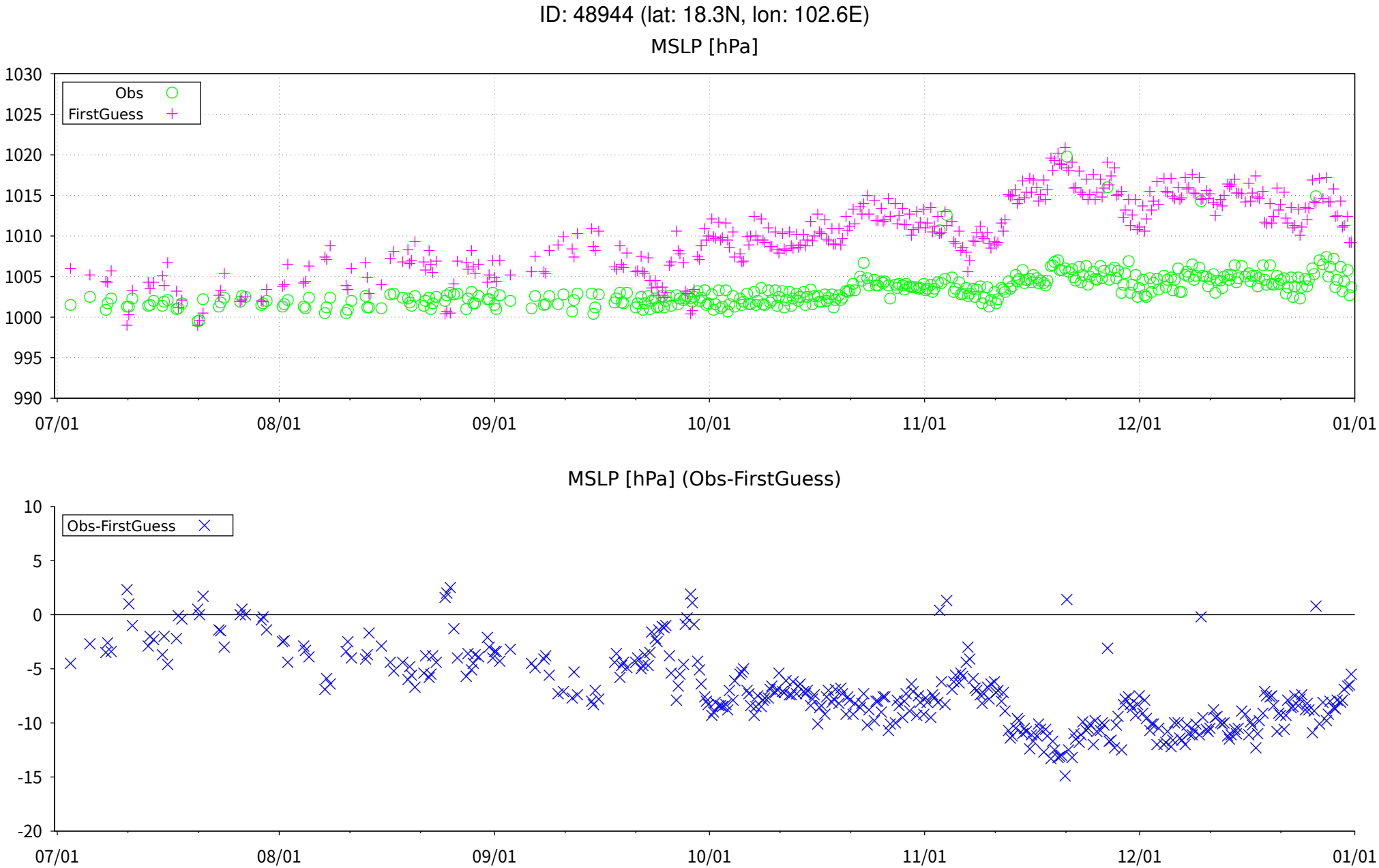

Figure 46(b) Time-series representation of MSLP Obs minus FirstGuess for station 48944

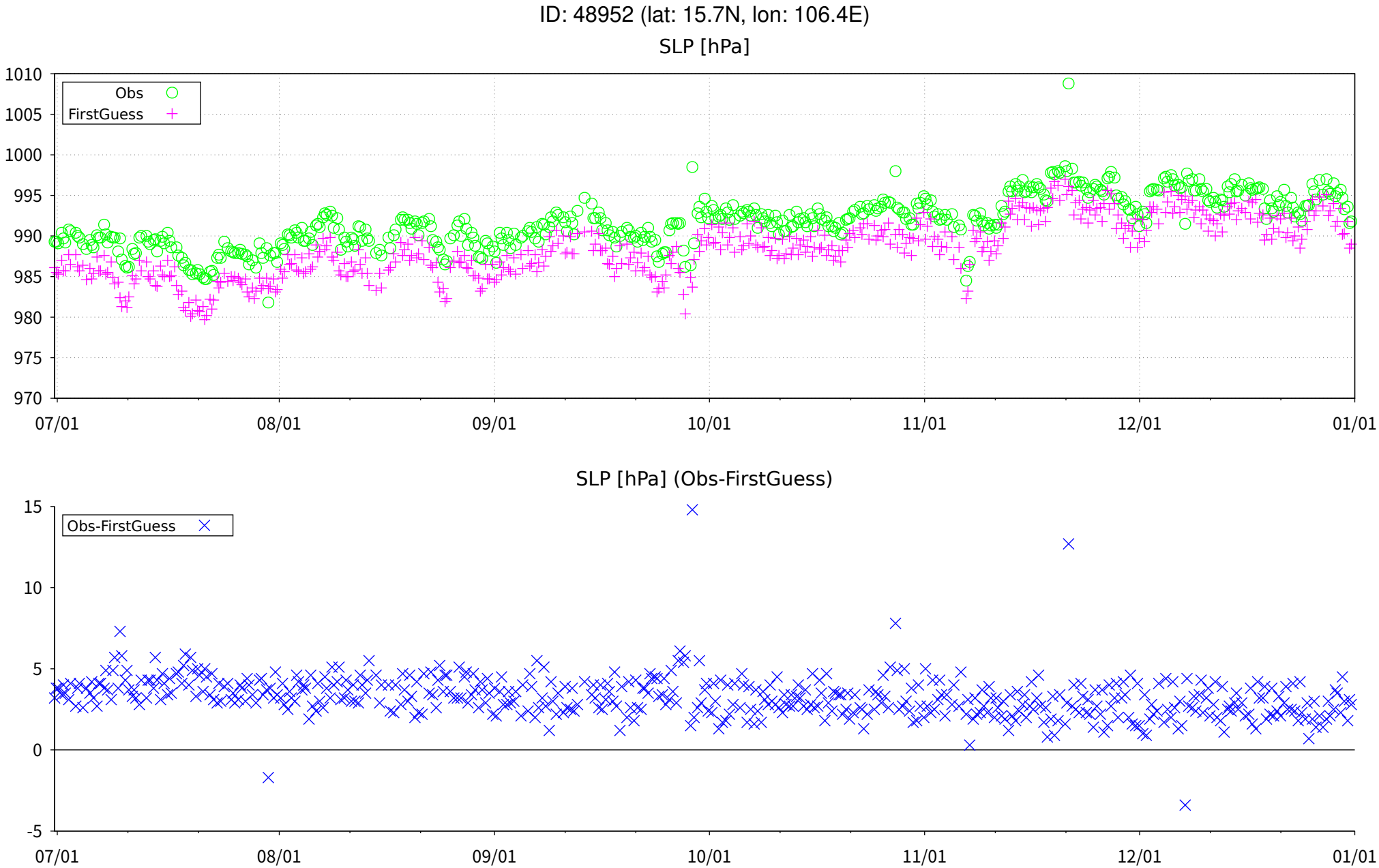

Figure 47 Time-series representation of SLP Obs minus FirstGuess for station 48952

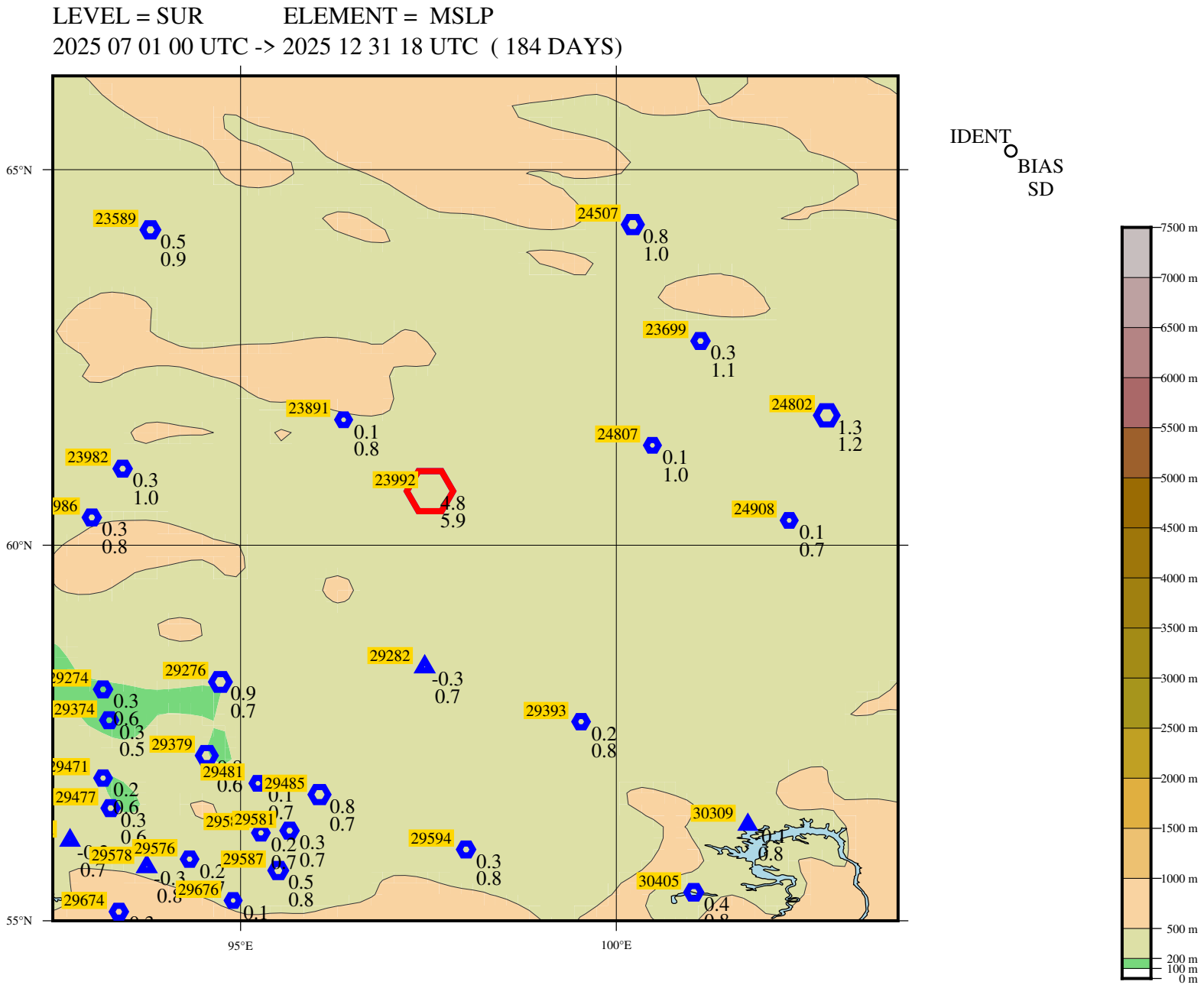

Figure 48 BIAS and SD of MSLP for station 23992 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

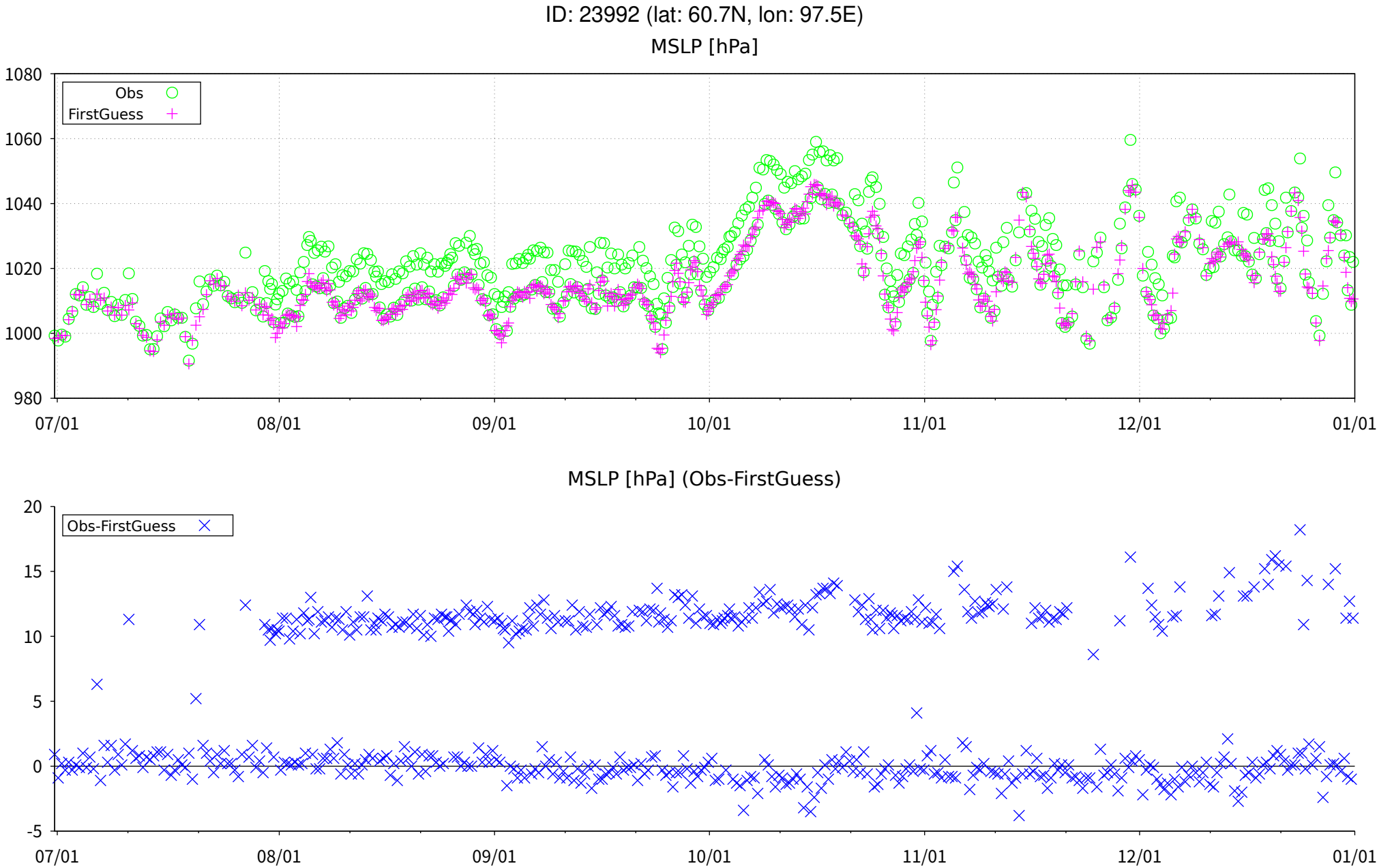

Figure 49 Time-series representation of MSLP Obs minus FirstGuess for station 23992

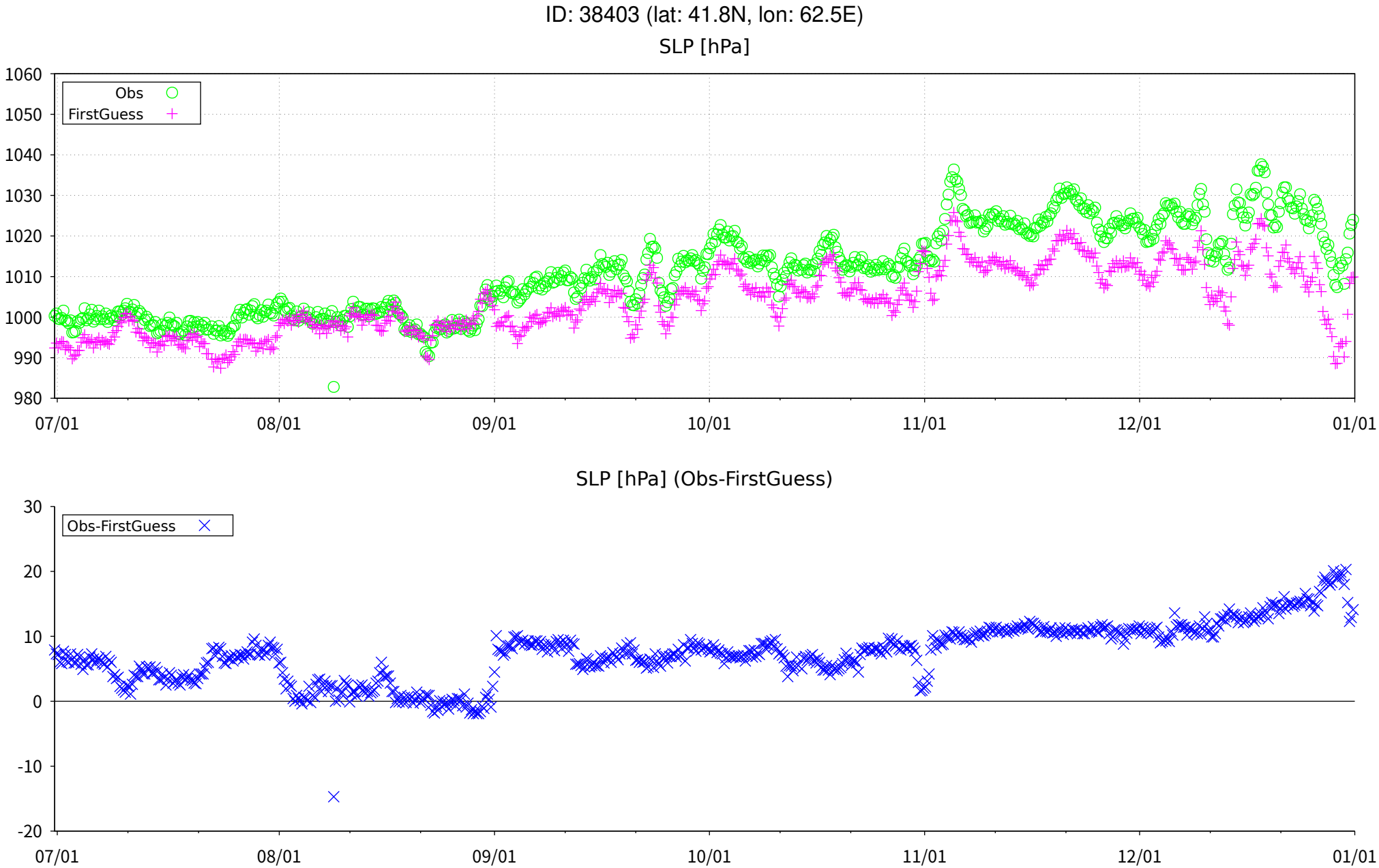

Figure 50(a) Time-series representation of SLP Obs minus FirstGuess for station 38403

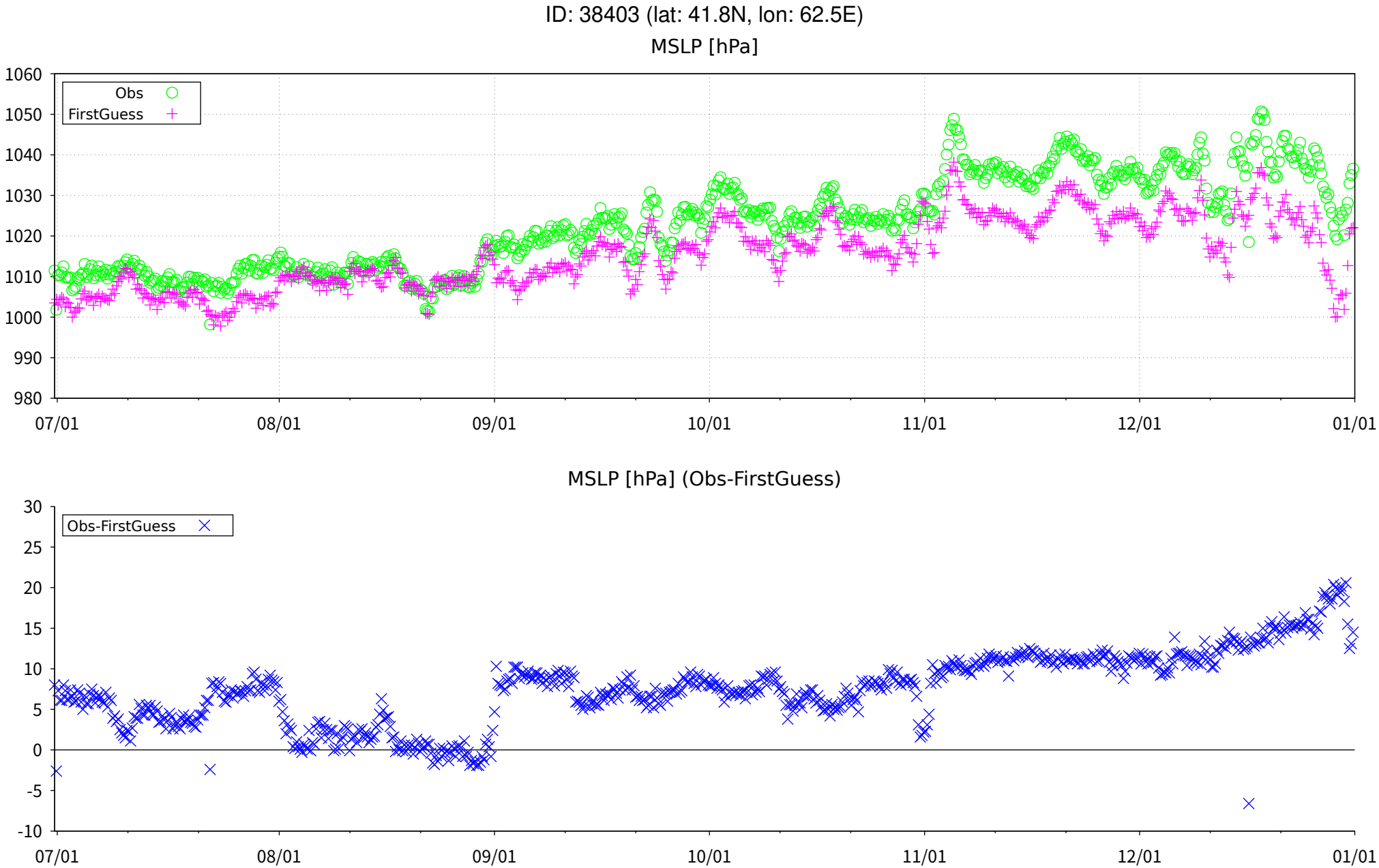

Figure 50(b) Time-series representation of MSLP Obs minus FirstGuess for station 38403

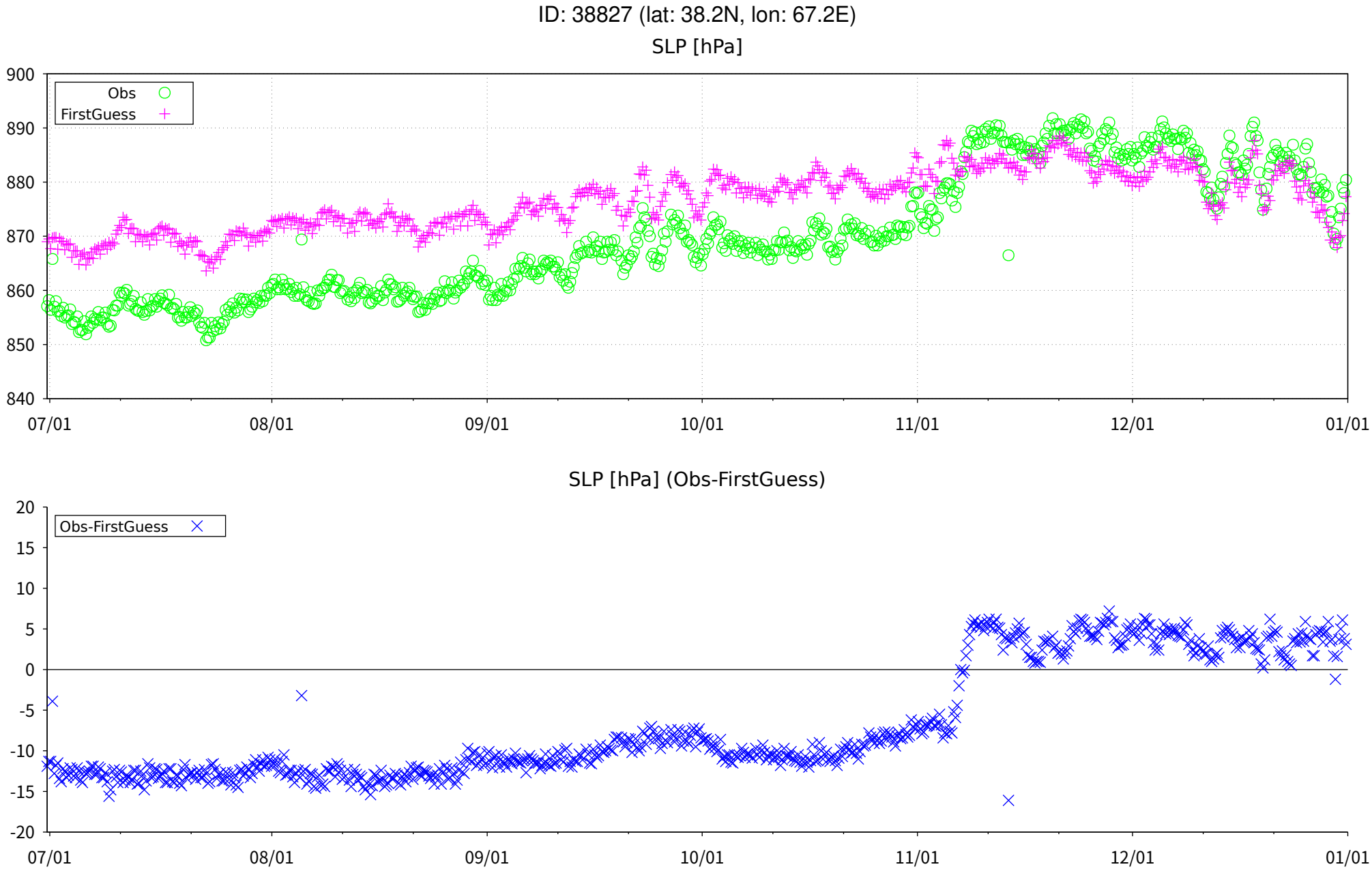

Figure 51(a) Time-series representation of SLP Obs minus FirstGuess for station 38827

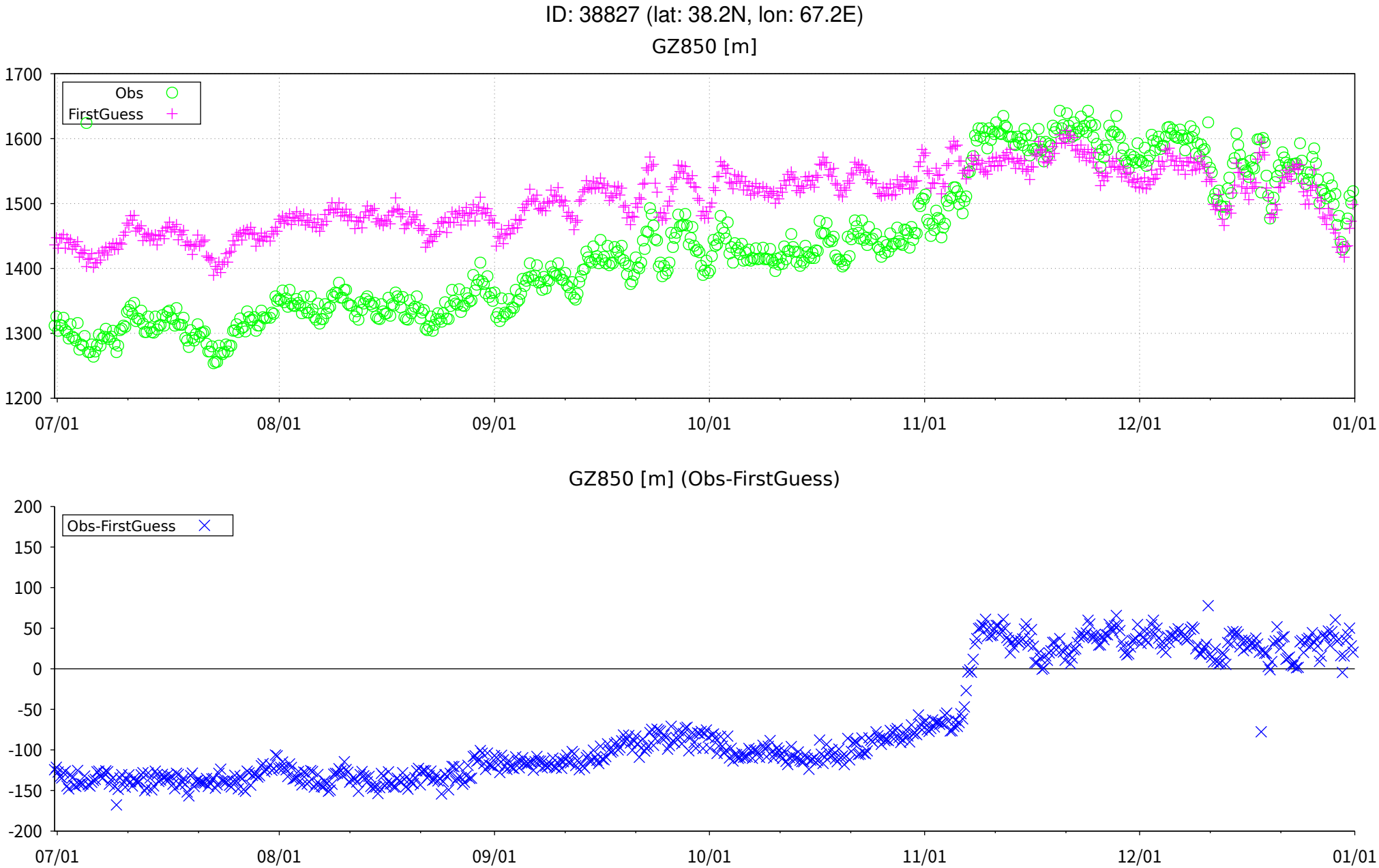

Figure 51(b) Time-series representation of GZ850 Obs minus FirstGuess for station 38827

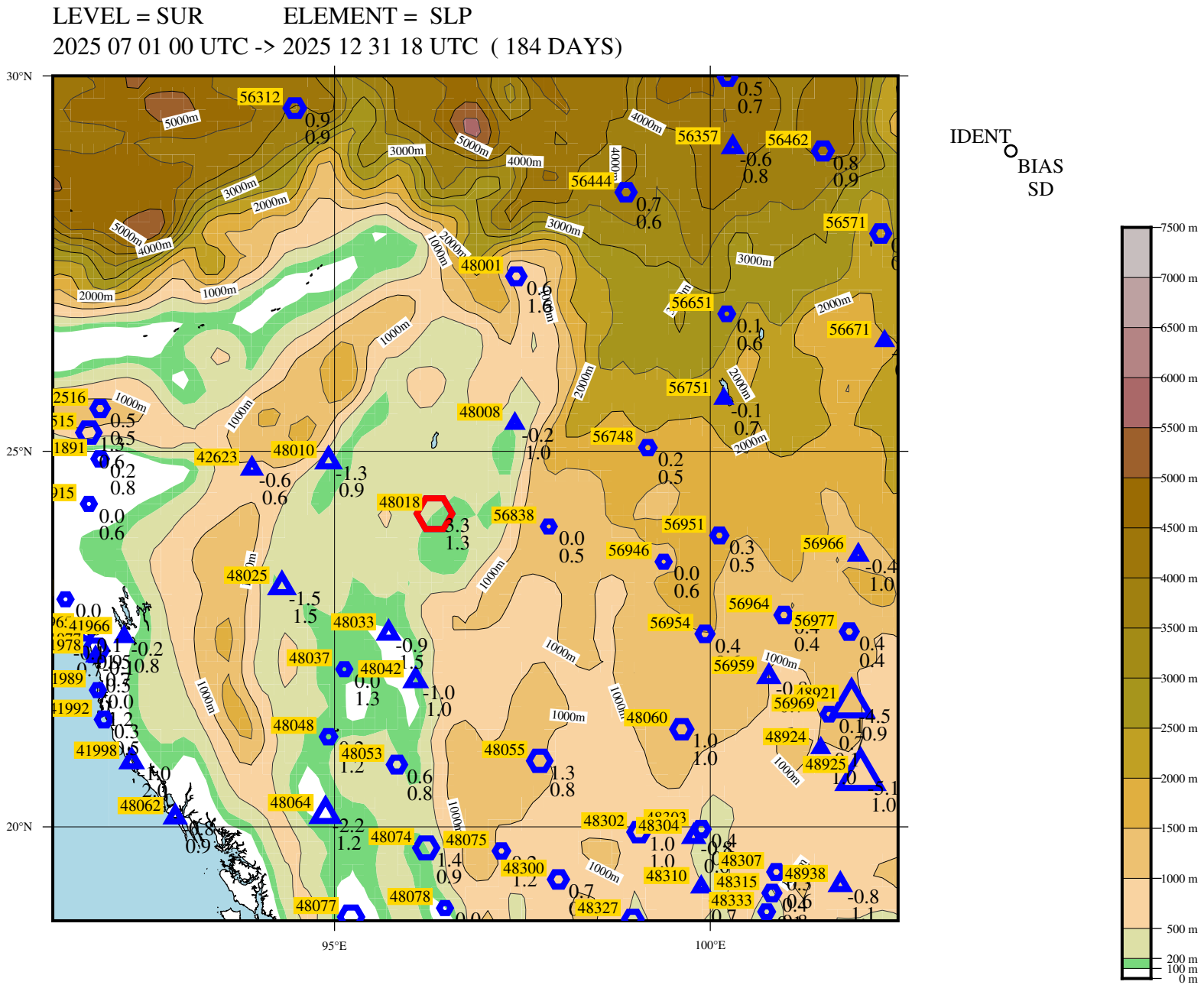

Figure 52 BIAS and SD of SLP for station 48018 (red) and surrounding stations (blue).
The number to the upper left of each symbol is the WMO IDENT, and those to the lower right are the values of BIAS and SD.
The size of each symbol is proportional to the value of BIAS, with hexagonal forms representing positive bias and triangular forms representing negative bias.

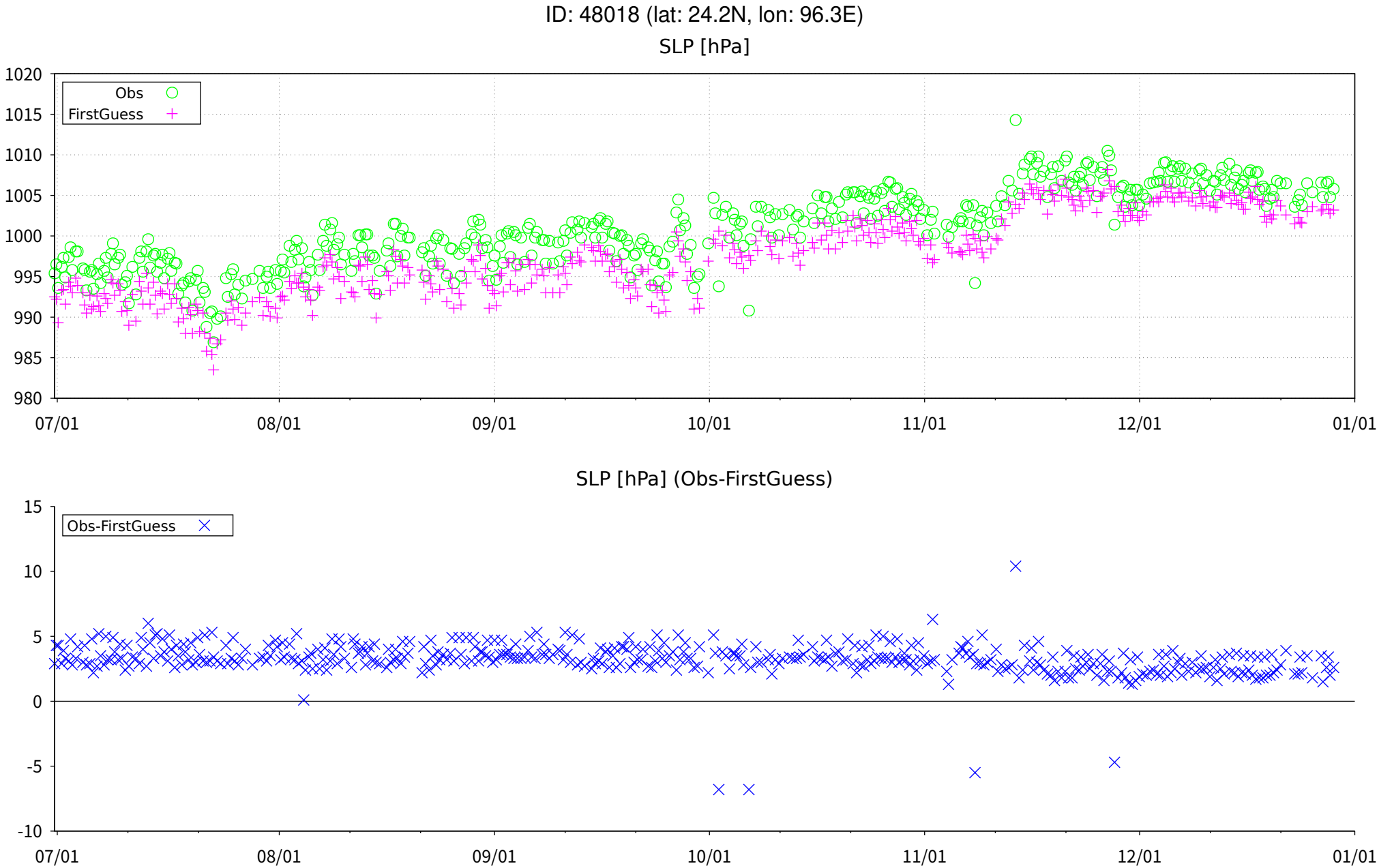

Figure 53 Time-series representation of SLP Obs minus FirstGuess for station 48018

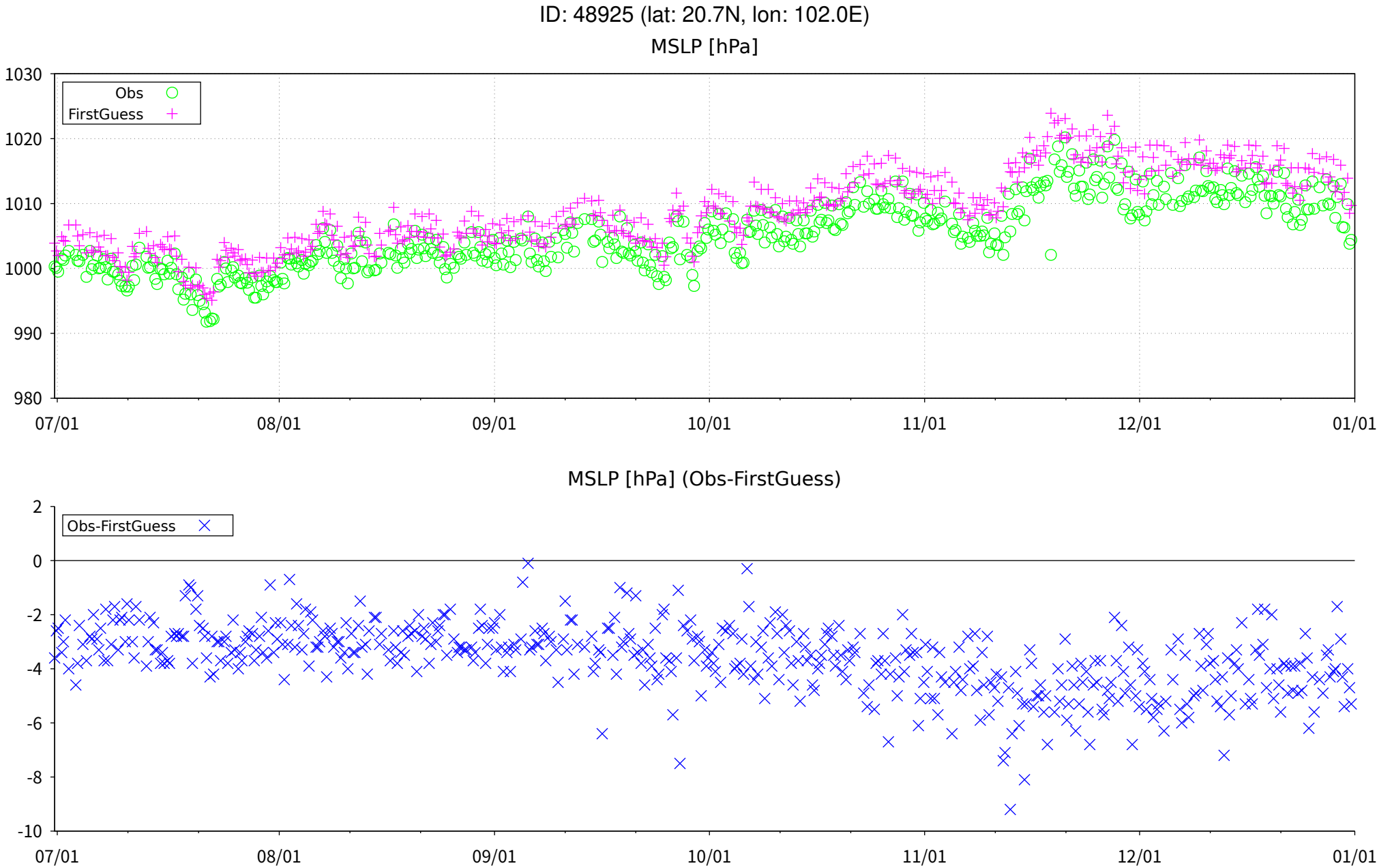

Figure 54 Time-series representation of MSLP Obs minus FirstGuess for station 48925

Figure 55(a) Time-series representation of SLP Obs minus FirstGuess for station 41171

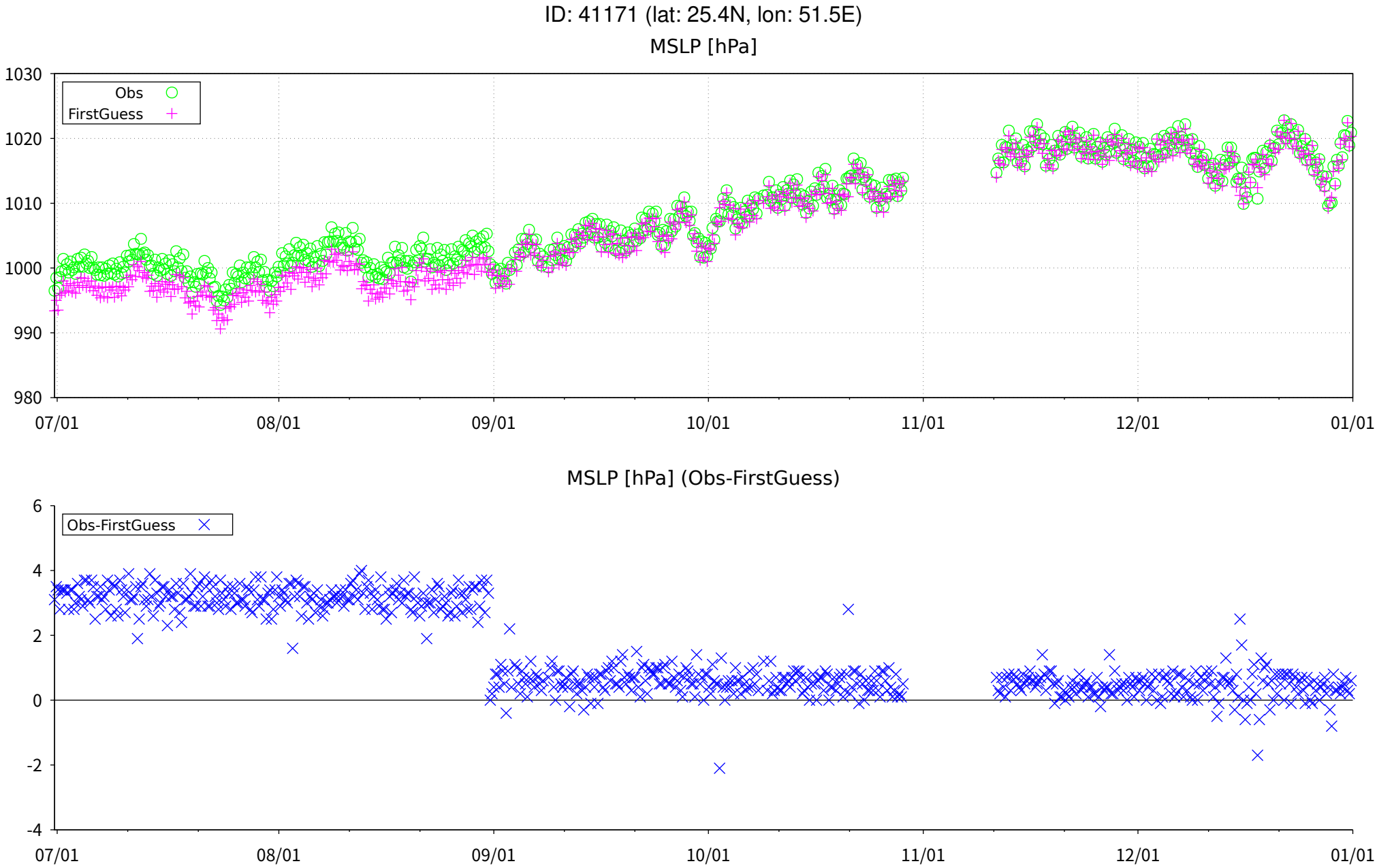

Figure 55(b) Time-series representation of MSLP Obs minus FirstGuess for station 41171

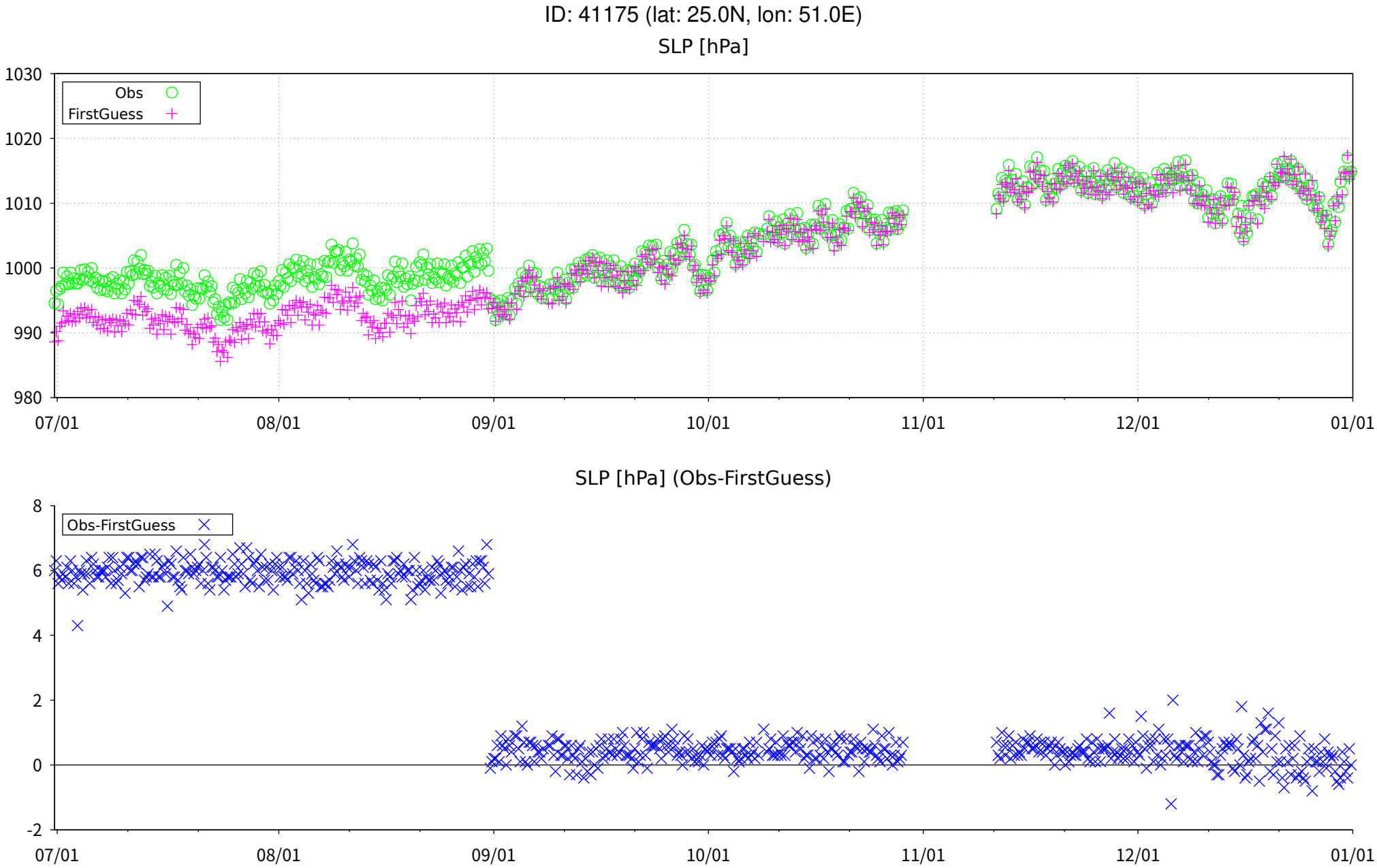

Figure 56(a) Time-series representation of SLP Obs minus FirstGuess for station 41175

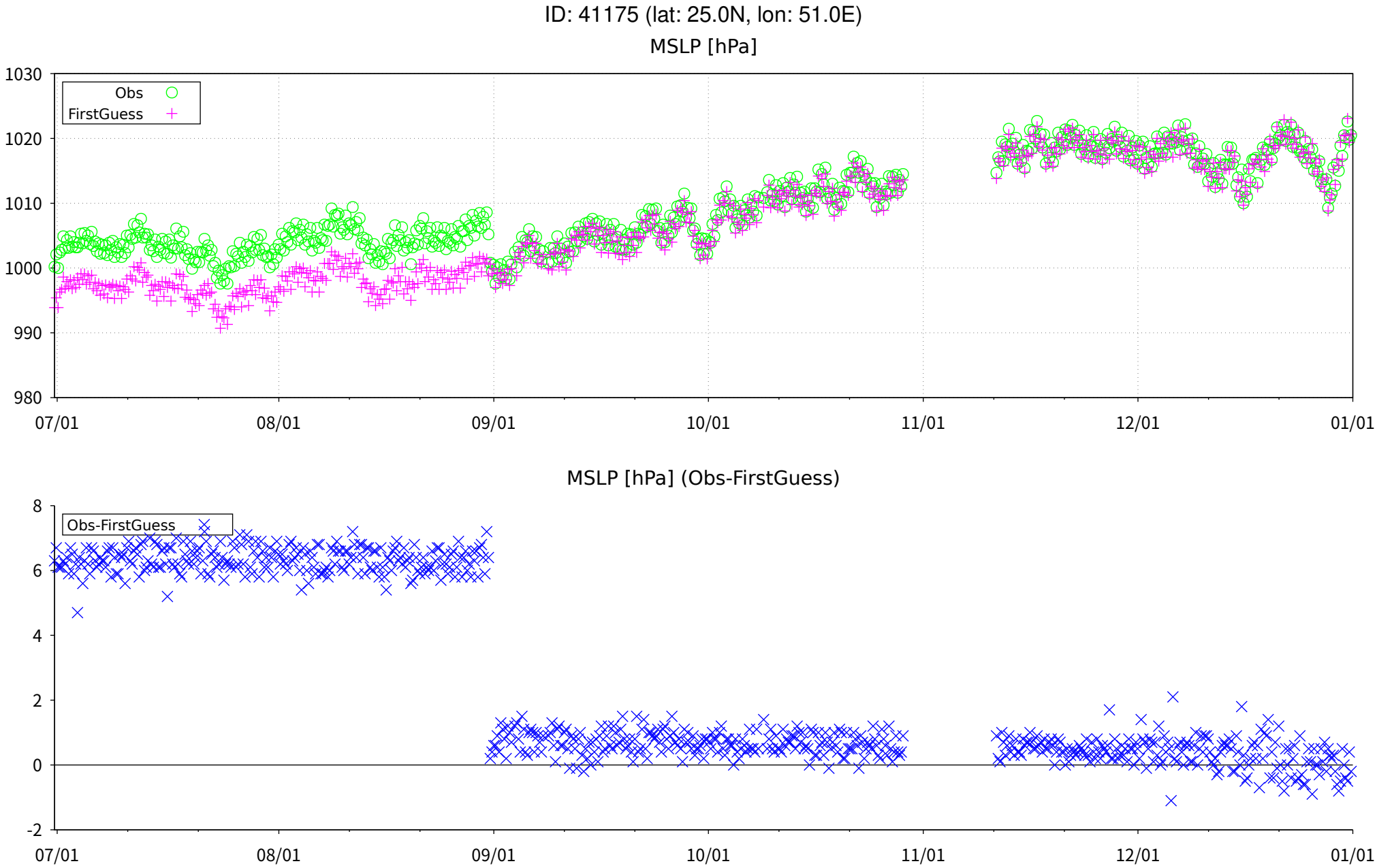

Figure 56(b) Time-series representation of MSLP Obs minus FirstGuess for station 41175

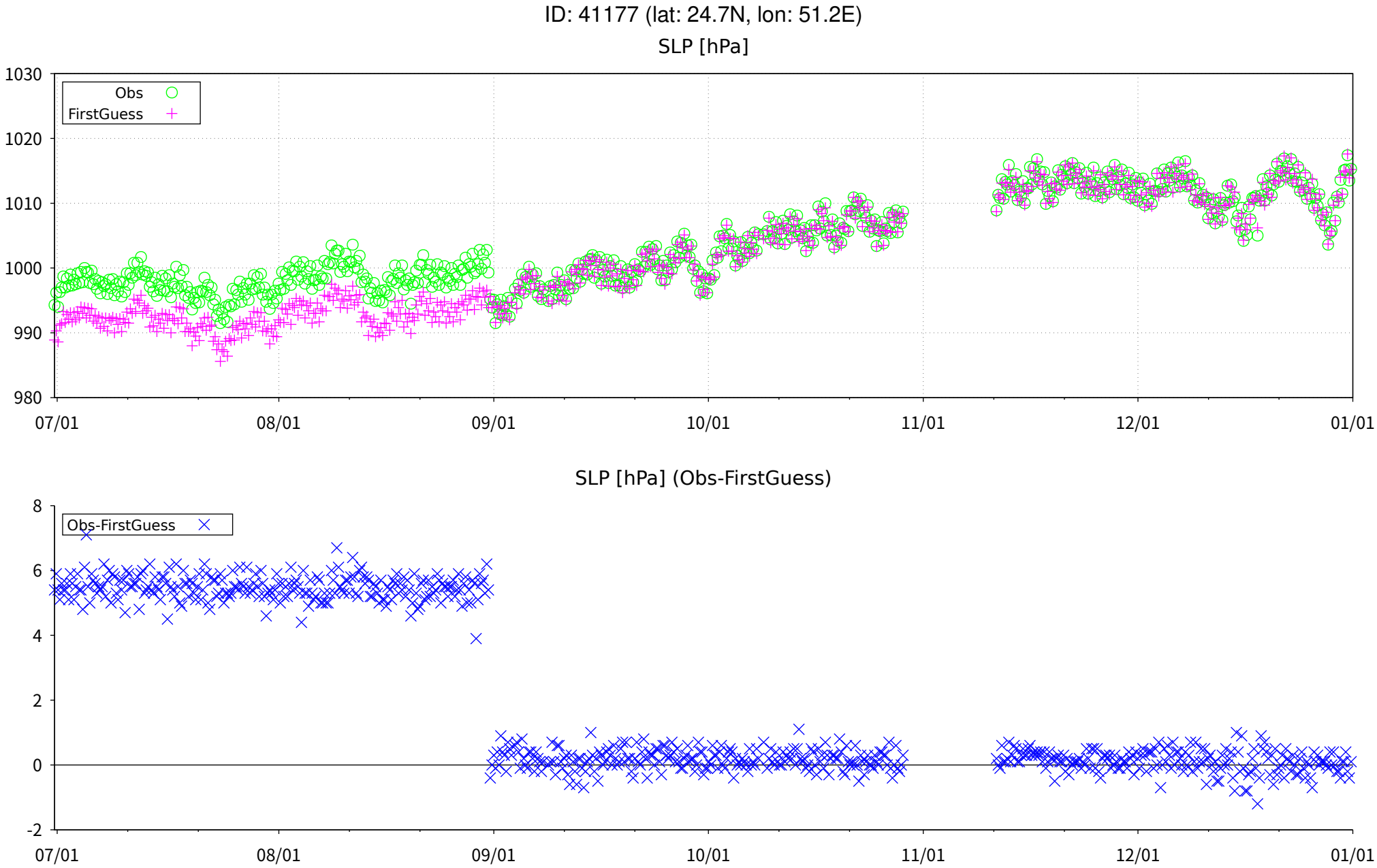

Figure 57(a) Time-series representation of SLP Obs minus FirstGuess for station 41177

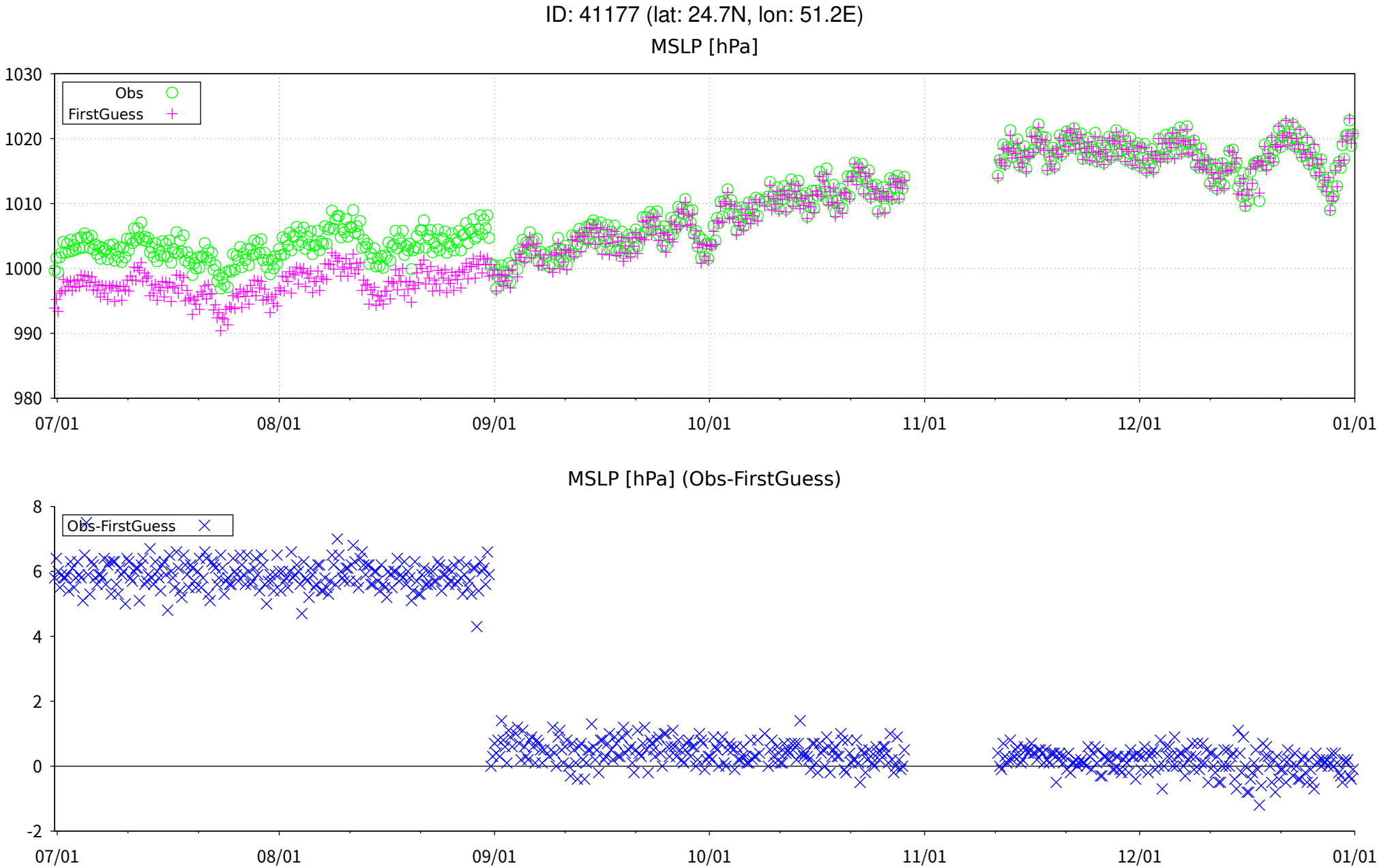

Figure 57(b) Time-series representation of MSLP Obs minus FirstGuess for station 41177

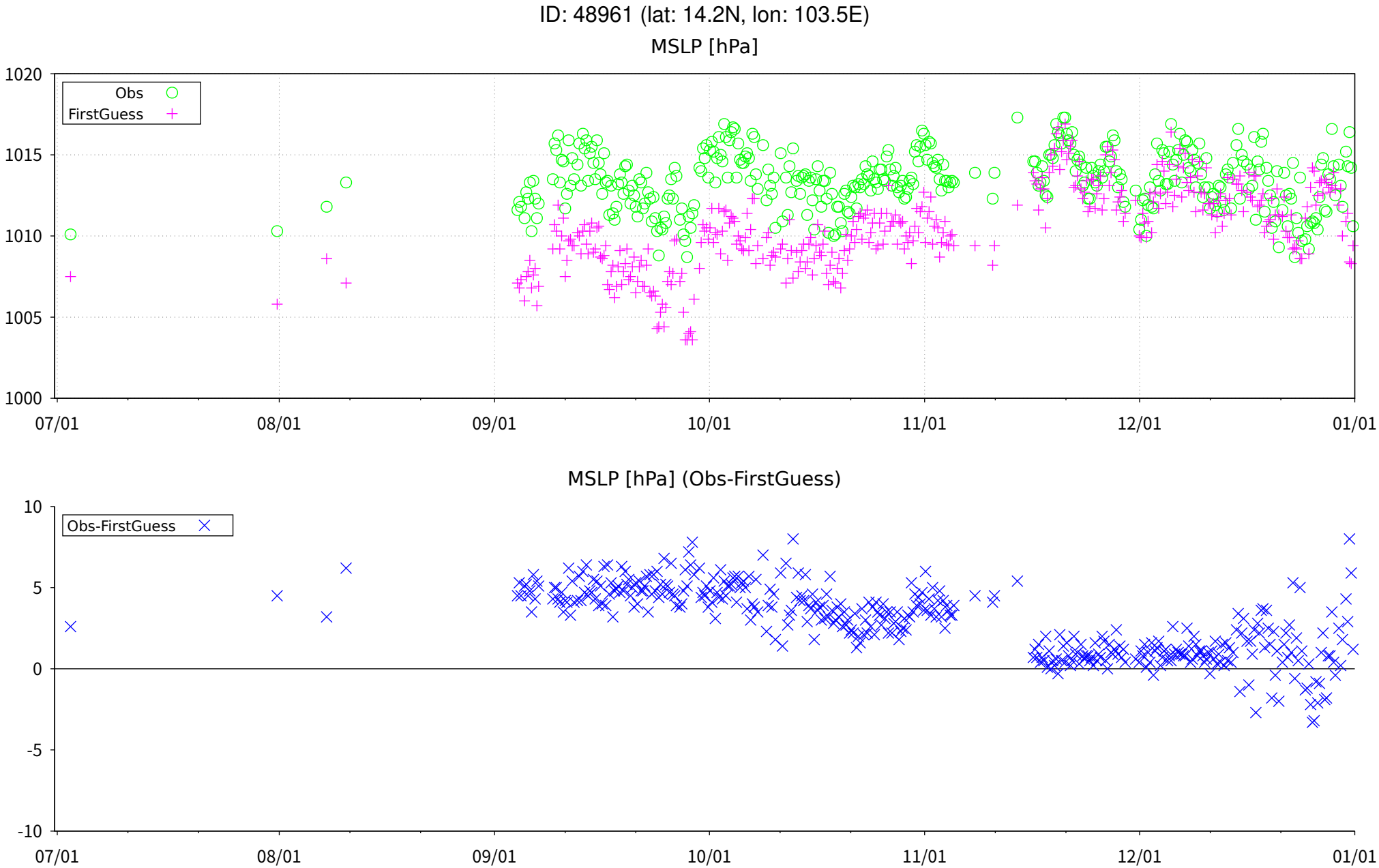

Figure 58 Time-series representation of MSLP Obs minus FirstGuess for station 48961

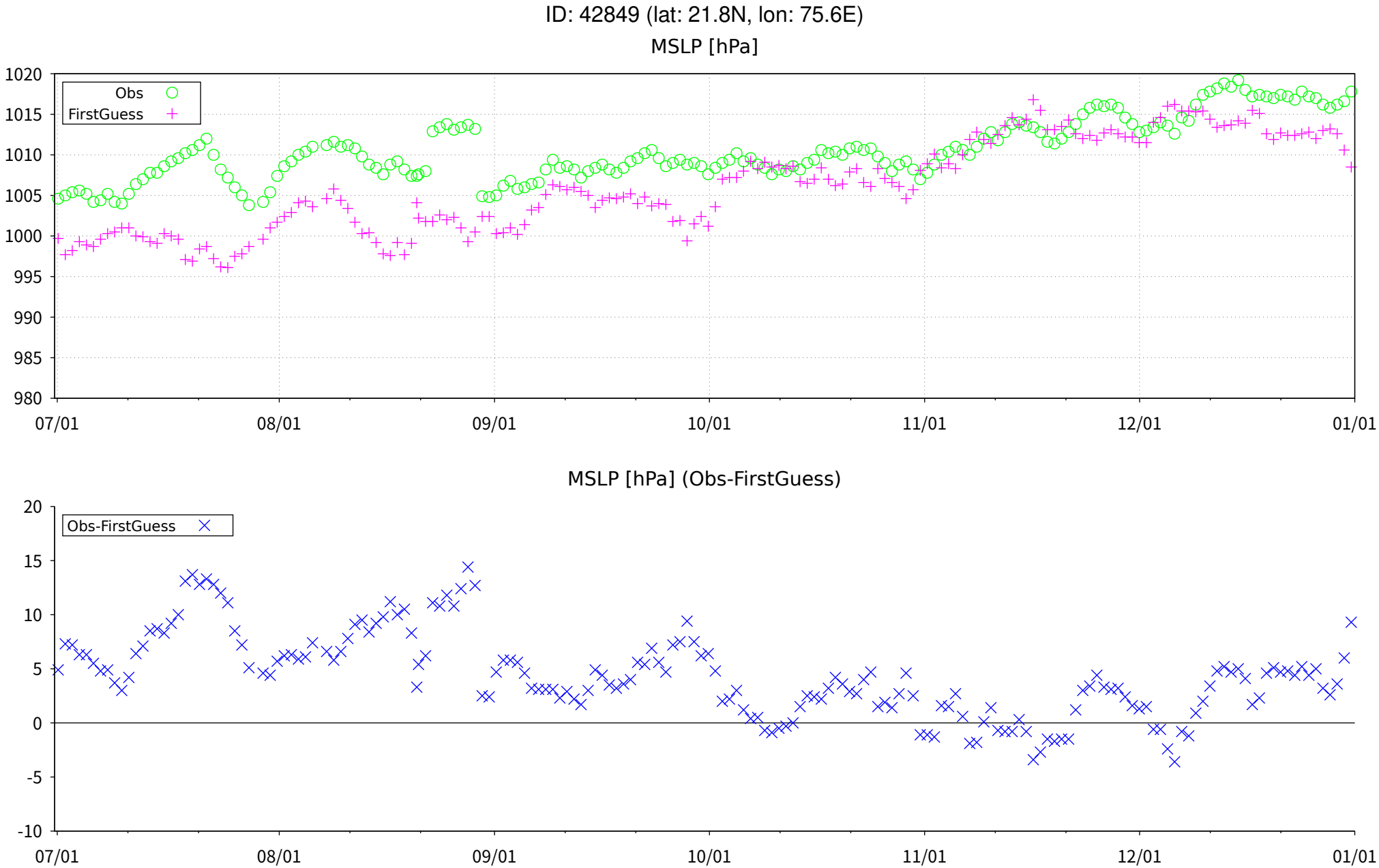

Figure 59 Time-series representation of MSLP Obs minus FirstGuess for station 42849

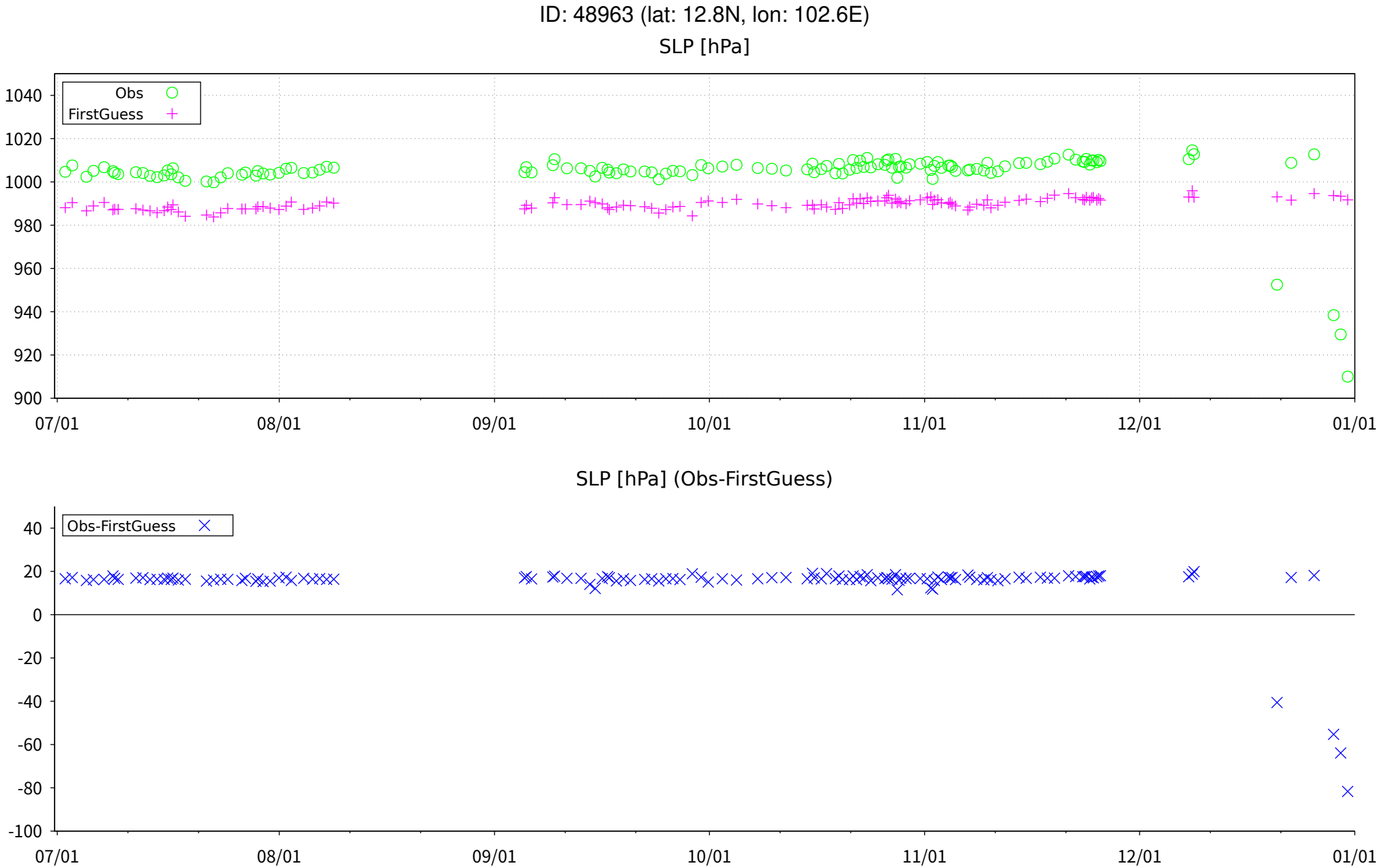

Figure 60(a) Time-series representation of SLP Obs minus FirstGuess for station 48963

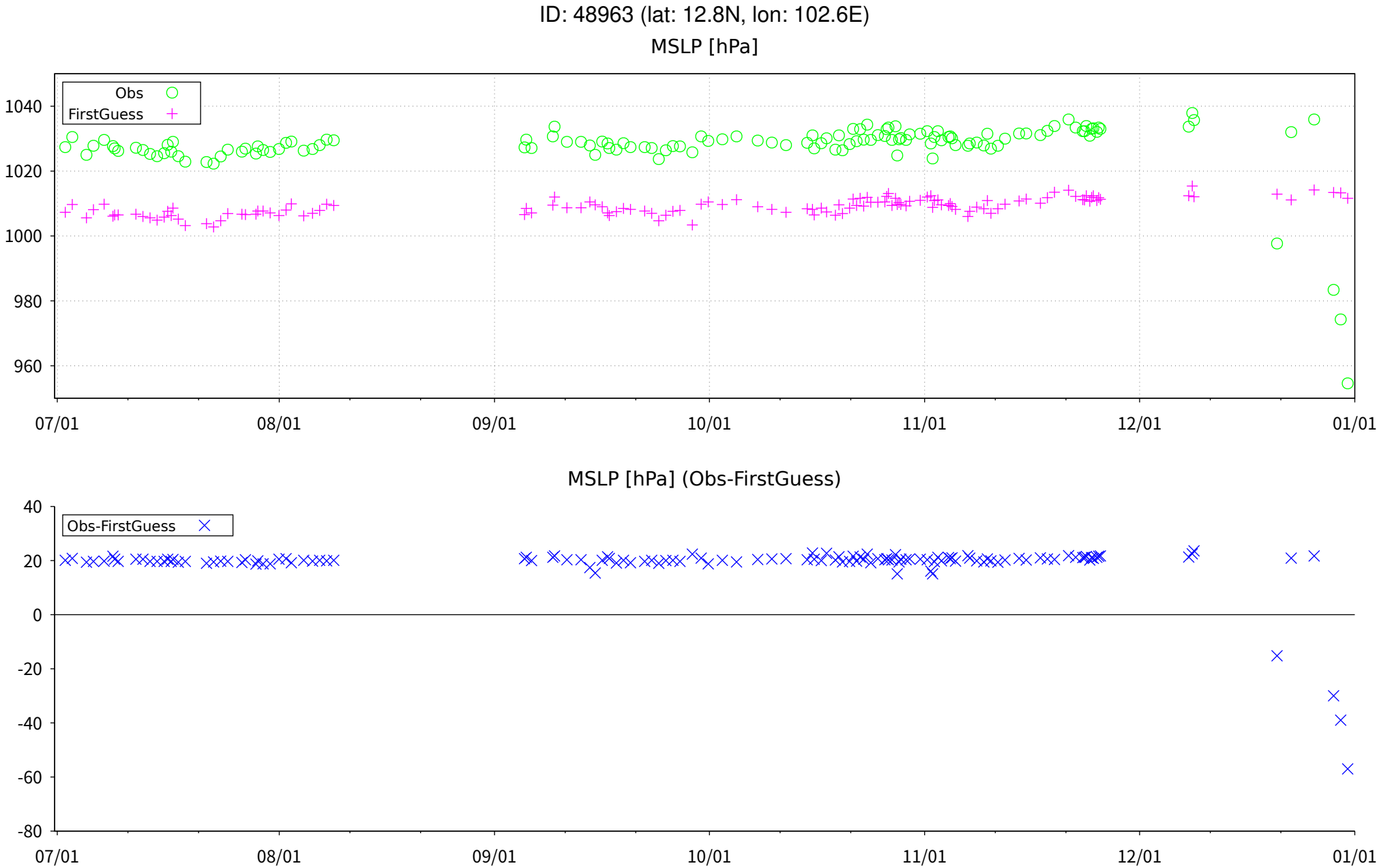

Figure 60(b) Time-series representation of MSLP Obs minus FirstGuess for station 48963

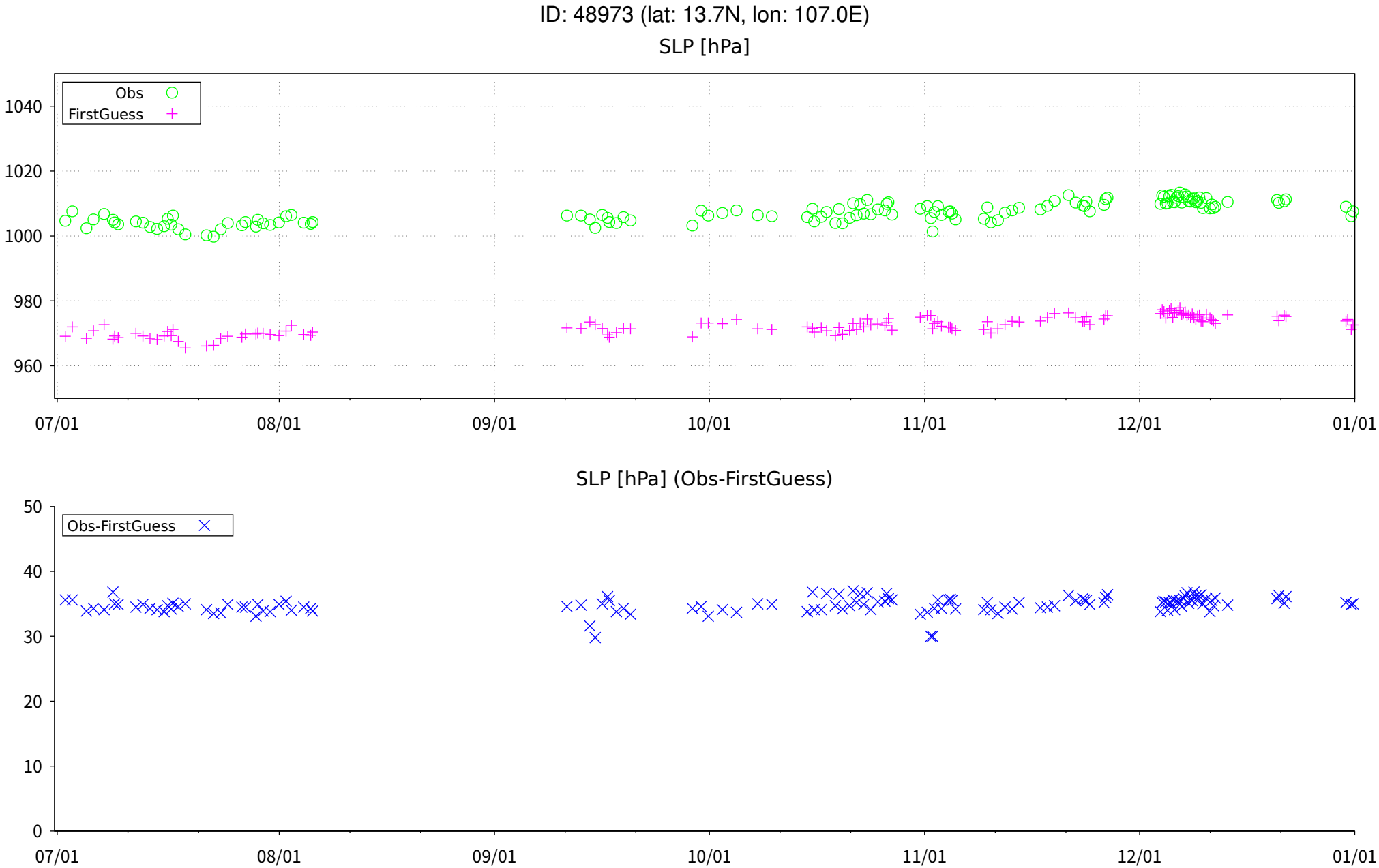

Figure 61(a) Time-series representation of SLP Obs minus FirstGuess for station 48973

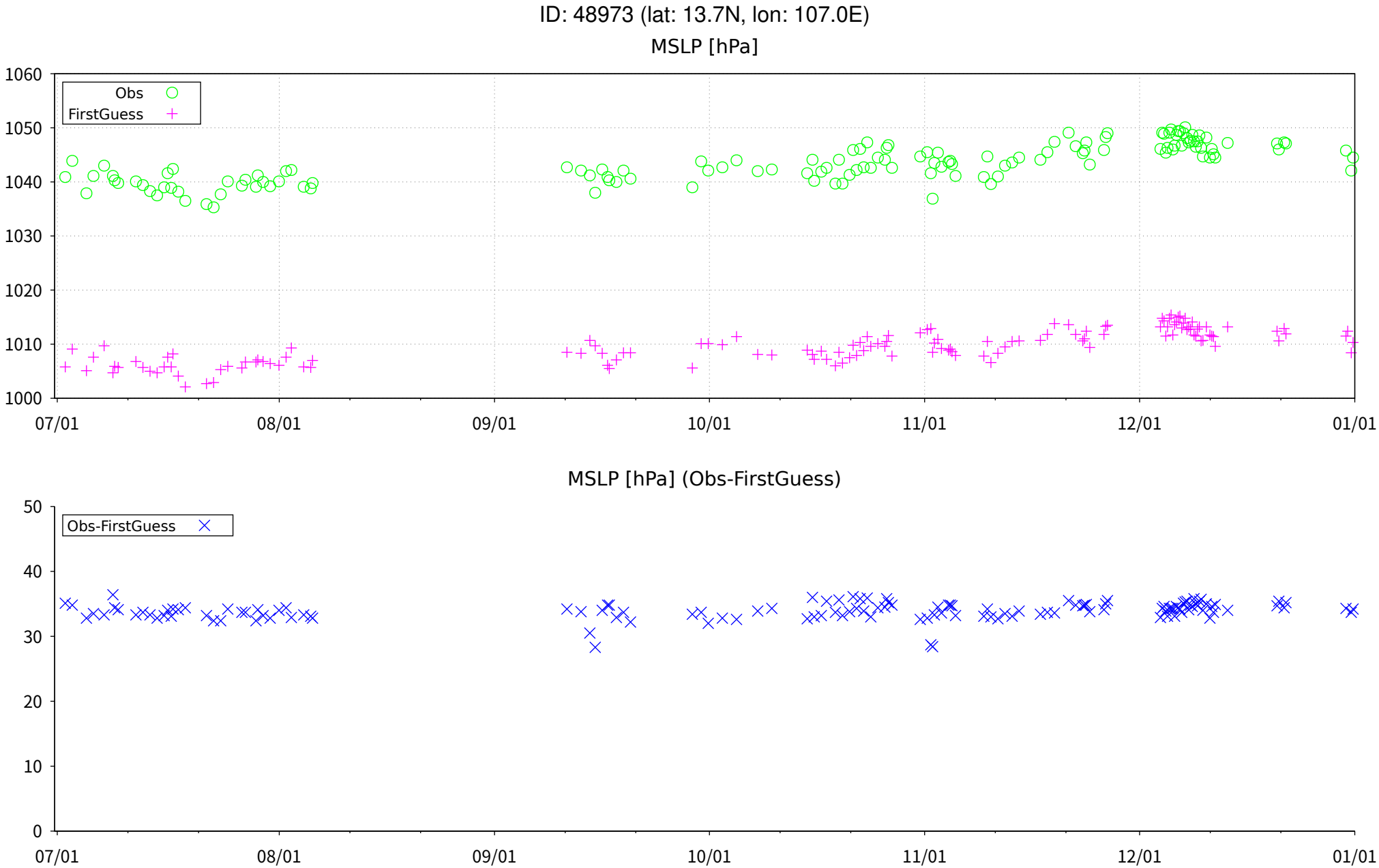

Figure 61(b) Time-series representation of MSLP Obs minus FirstGuess for station 48973