Radiosonde-No.9-MOC-CMA(2026)

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

September 2026

Regional WIGOS Centre, Beijing

China Meteorological Administration

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Introduction

In its role as a Regional WIGOS Centre (RWC) in Regional Association (RA) II, China Meteorological Administration (CMA) has issued the monthly report on the radiosonde observation quality monitoring of September 2026. The report includes a consolidated list of suspect stations that produced low-quality observation data.

CMA was designated as a Regional WIGOS Centre in RA II. The Centre is responsible for monitoring the quality of meteorological observations and maintaining consolidated lists of suspect stations of reporting low-quality observation data together with adequate evidence. The lists are to be passed on to the WMO secretariat and monitoring centres participating in the activity as well as to Members of RA II for their reference.

1. Data Acquisition

Radiosonde observation data are collected at GTS, including 2 times: 00 and 12(UTC). The observation elements are geopotential height(GPH), vector wind (WIN_S) and wind direction (WIN_D).

2. Monitoring Standard

2.1 Geopotential Height

*Standard of comparison: First guess field from CMA_GFS model

*Observation times: 00, 12 UTC

*Levels monitored: Standard levels from 1000 - 30 hPa

*Element monitored: Geopotential Height (m)

*Parameters monitored:

NUM OBS: Number of observations received excluding duplicates

NUM GRS: Number of observations with gross errors

% REJ: Percentage of observations rejected by quality control

SD: Standard deviation of differences of observations from first guess field

BIAS: Mean difference of observations from first guess field

RMS: Root mean square of differences of observations from first guess field

(SD, BIAS and RMS are estimated excluding observations with gross errors)

*GROSS ERROR LIMIT:

Level (hPa)	Geopotential Height (m)
1000	100
925	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

*SELECTION CRITERIA:

at least 3 levels with NUM OBS ≥ 10 and 100 m weighted RMS

only the worst level is shown (with unweighted RMS)

2.2 Vector Wind

*Standard of comparison: First guess field from CMA_GFS model

*Observation times: 00, 12 UTC

*Levels monitored: Standard levels from 1000 - 100 hPa

*Element monitored: Vector Wind (m/s)

*Parameters monitored:

NUM OBS: Number of observations received excluding duplicates

NUM GRS: Number of observations with gross errors

% REJ: Percentage of observations rejected by quality control

U,V BIAS: Mean difference of observations from first guess field

RMS: Root mean square of differences of observations from first guess field

(BIAS and RMS are estimated excluding observations with gross errors)

*GROSS ERROR LIMIT:

Level (hPa)	Vector Wind (m/s)
1000	35
925	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45

*SELECTION CRITERIA:

at least 1 level with NUM OBS ≥ 10 and RMS ≥ 15 m/s

standard level (1000 - 100 hPa) with highest RMS is shown

2.3 Wind Direction

*Standard of comparison: First guess field from CMA_GFS model

*Observation times: 00, 12 UTC

*Levels monitored: Standard levels from 500 - 150 hPa

*Element monitored: Wind Direction (degrees, clockwise)

*Parameters monitored:

NUM OBS: Minimum number of observations received excluding duplicates at each level

(excluding gross errors and data with wind speed < 5 m/s)

BIAS: Mean difference of observation from first guess field, averaged over the monitoring levels

MAX SPREAD: Maximum absolute difference of SD at any level from SD at all levels

SD: Standard deviation of differences of observations from first guess field at all levels

(BIAS, MAX SPREAD and SD are estimated excluding observations with gross errors and low wind speed)

*GROSS ERROR LIMIT:

Level (hPa)	Wind Direction (°)
500	45
400	50
300	60
250	60
200	50
150	50

*SELECTION CRITERIA:

NUM OBS ≥ 5 and

|BIAS| ≥ 10 degrees with

SD < 30 degrees and

MAX SPREAD < 10 degrees

3. Monitoring Results

3.1 Non-Reporting Stations with Operational Status

Table 1 List of non-reporting stations with operational status from September

INDEX	STATION_CODE	STATION_NAME	MEMBER	LAT	LON
1	23078*	NORIL'SK	Russian Federation	69.35	88.26
2	24944	OLEKMINSK (24944-1)	Russian Federation	60.37	120.42
3	25428*	OMOLON	Russian Federation	65.23	160.53
4	31168	AYAN	Russian Federation	56.45	138.15
5	31538*	SUTUR	Russian Federation	50.07	132.13
6	32150*	JUZHNO-SAHALINSK	Russian Federation	46.95	142.72
7	32477*	SOBOLEVO	Russian Federation	54.30	155.92
8	38836	DUSHANBE	Tajikistan	38.58	68.73
9	38954	KHOROG	Tajikistan	37.50	71.50
10	40582*	KUWAIT INTERNATIONAL AIRPORT (40582-1)	Kuwait	29.24	47.97
11	40650	BAGHDAD INT. AIRPORT	Iraq	33.30	44.40
12	40745*	MASHHAD	Iran, Islamic Republic of	36.24	59.63
13	40754*	TEHRAN-MEHRABAD	Iran, Islamic Republic of	35.69	51.31
14	40766*	KERMANSHAH	Iran, Islamic Republic of	34.35	47.15

15	40811*	AHWAZ	Iran, Islamic Republic of	31.34	48.74
16	40875	BANDARABBASS	Iran, Islamic Republic of	27.21	56.37
17	40938	HERAT	Afghanistan	34.22	62.22
18	40948	KABUL AIRPORT	Afghanistan	34.55	69.22
19	41217*	ABU DHABI INTERNATIONAL AIRPORT	United Arab Emirates (the)	24.43	54.65
20	41594	SARGODHA (41594-0)	Pakistan	32.05	72.67
21	41661	QUETTA (SHEIKH MANDA)	Pakistan	30.27	66.92
22	41780	KARACHI AIRPORT	Pakistan	24.90	67.13
23	42361	GWALIOR	India	26.23	78.25
24	43311	AMINIDIVI	India	11.12	72.73
25	43333	PORT BLAIR	India	11.67	92.72
26	43369	MINICOY	India	8.28	73.06
27	48042*	MANDALAY	Myanmar	21.94	96.09
28	48097*	YANGON	Myanmar	16.86	96.15
29	48839*	BACH LONG VI (Radiosonde)	Viet Nam	20.13	107.72

This list includes the non-reporting stations with operational status during September, please check the status of the stations. If it is closed or silent, please update the declared status in OSCAR/Surface. In addition, “*” represents GBON station.

3.2 Geopotential Height (GPH)

3.2.1 List of Suspect Stations

Table 2 List of GPH suspected in September 2026

INDEX	STATION_CODE	MEMBER	OBS TIME	LEVEL	NUM OBS	NUM GRS	REJ（%）	BIAS	SD	RMS
1	23955*	Russian Federation	12	50	22	0	0	120.9	49.4	130.6
2	25703*	Russian Federation	00	30	27	0	0	11.1	208.5	208.8

3	29839*	Russian Federation	00	50	25	0	0	105.8	76.1	130.3
4	29839*	Russian Federation	12	50	23	1	0	86.6	98	130.8
5	30054*	Russian Federation	00	50	15	0	0	-110.5	85.3	139.6
6	31300*	Russian Federation	12	30	25	0	0	-162.6	106.9	194.6
7	32618*	Russian Federation	00	30	27	0	0	184.1	142.2	232.6
8	42079	India	00	30	17	3	0	-17.2	205.4	206.1
9	42348	India	00	925	26	0	0	43.9	7.5	44.5
10	42348	India	12	925	12	0	0	51	16.4	53.5
11	43110	India	12	70	13	0	0	24.7	156.4	158.3
12	43285	India	00	50	16	5	0	66.2	125.2	141.6
13	54374	China	00	30	27	0	0	179.1	107.1	208.7

3.2.2 Suspect Station Analysis

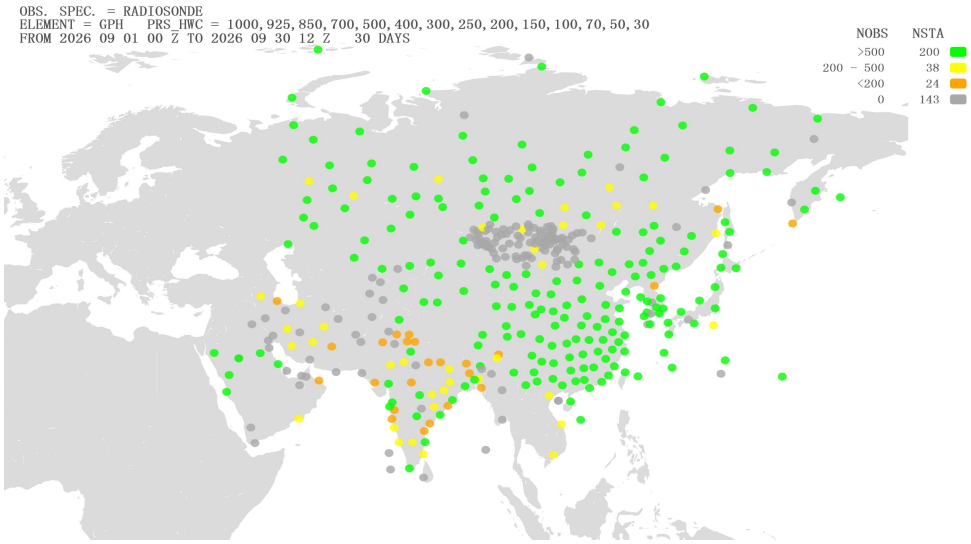


Figure 1 Location of all radiosonde stations reporting geopotential height observations in Region II over the month of September 2026. NOBS shows the total number of observations received at RWC-Beijing, corresponding total number of stations (NSTA) and color scale are shown at the top of the figure, color green refers to NOBS is higher than 500, color yellow refers to NOBS is between 200 and 500(including 500), color orange refers to NOBS is between 0 and 200(including 200), and color gray refers to NOBS is 0

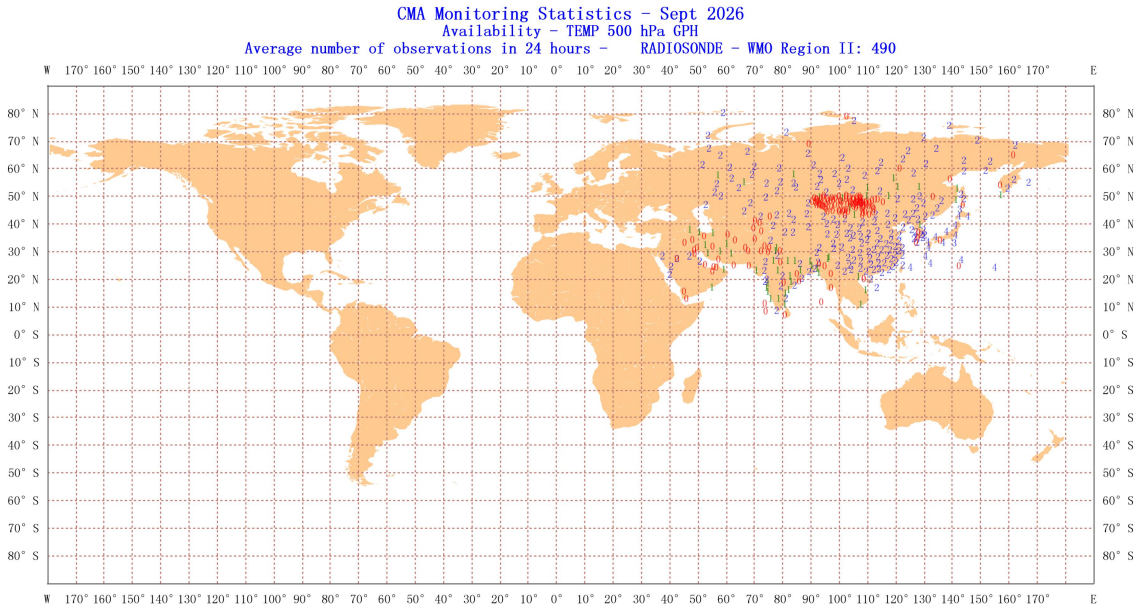


Figure 2 Location of all radiosonde stations reporting geopotential height average number of observations in 24 hours in Region II over the month of September 2026

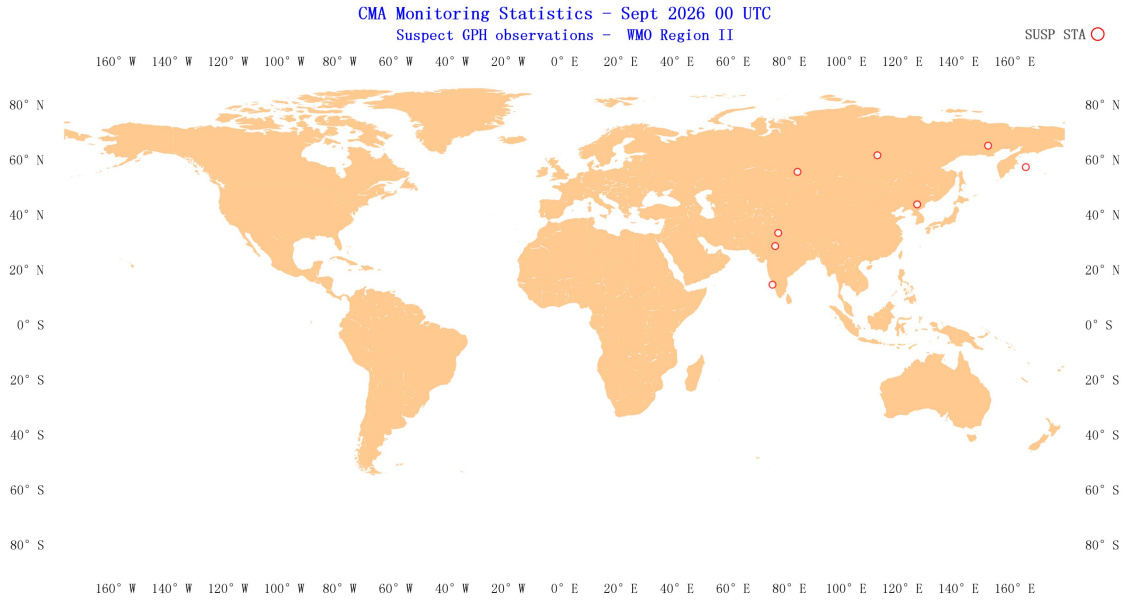


Figure 3 Distribution of suspect stations - Geopotential Height 00 UTC

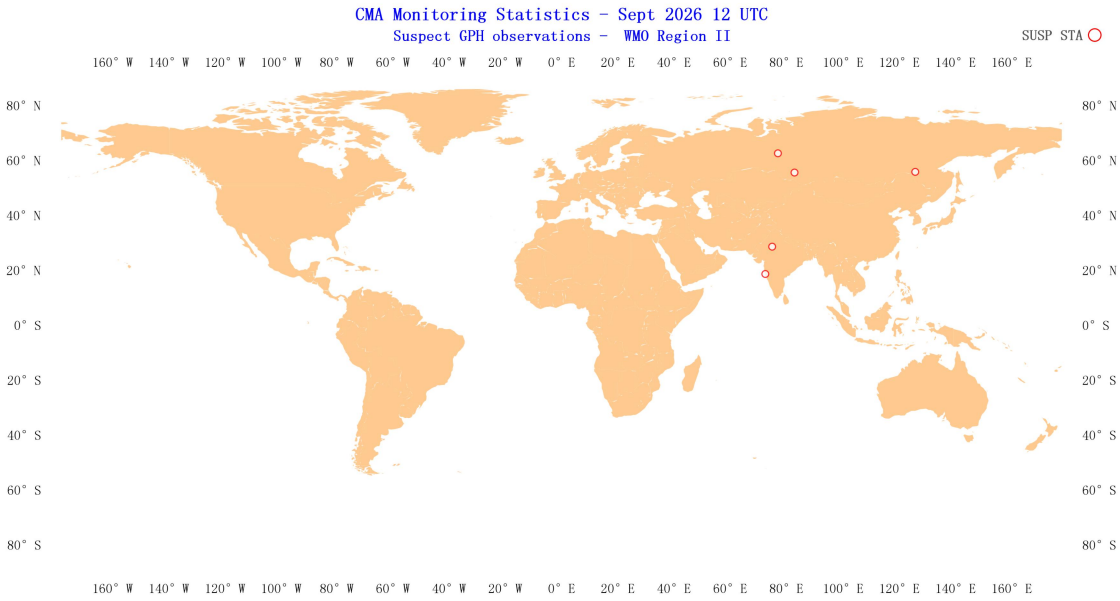


Figure 4 Distribution of suspect stations - Geopotential Height 12 UTC

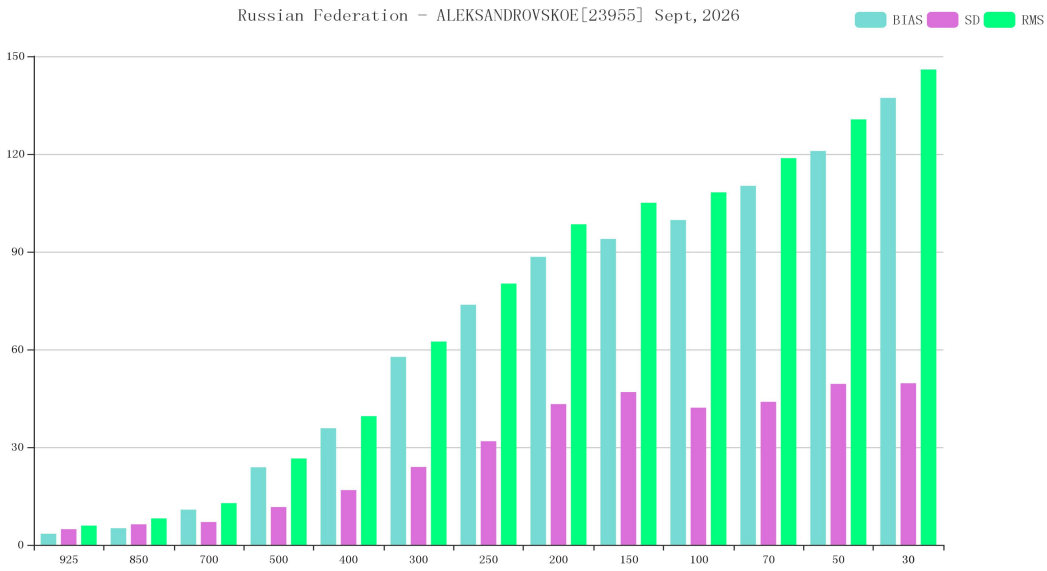


Figure 5 BIAS、SD and RMS of GPH for station 23955*(OBS-TIME:12)

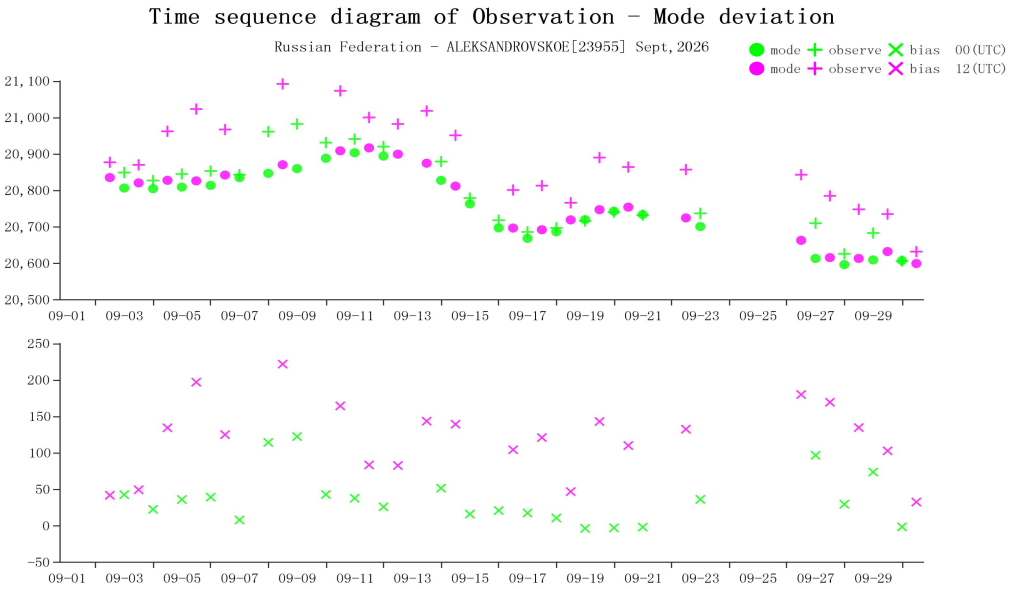


Figure 6 Time-series representation of GPH Obs minus first guess for station 23955*(Level:50)

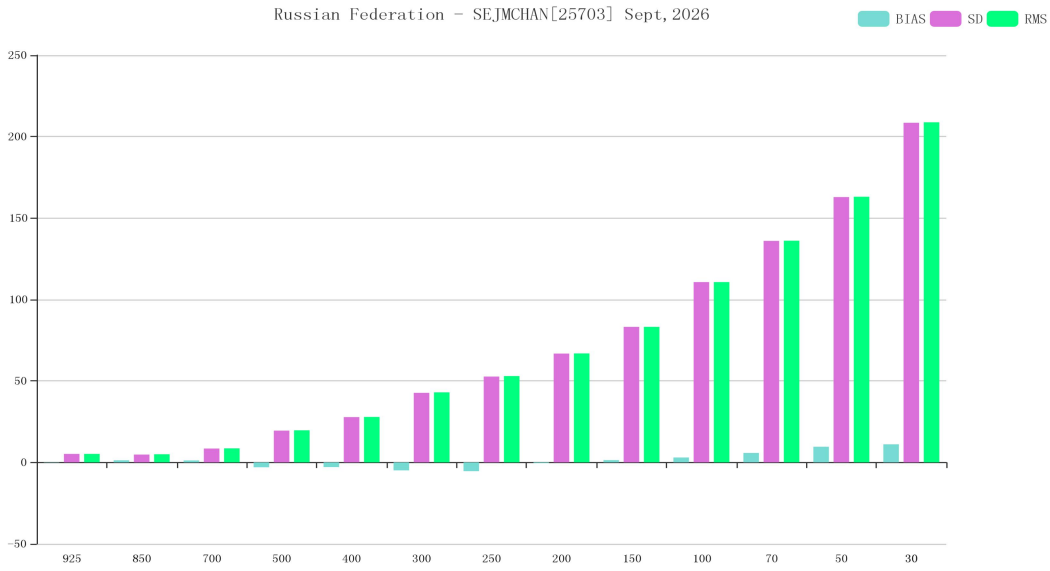


Figure 7 BIAS、SD and RMS of GPH for station 25703*(OBS-TIME:00)

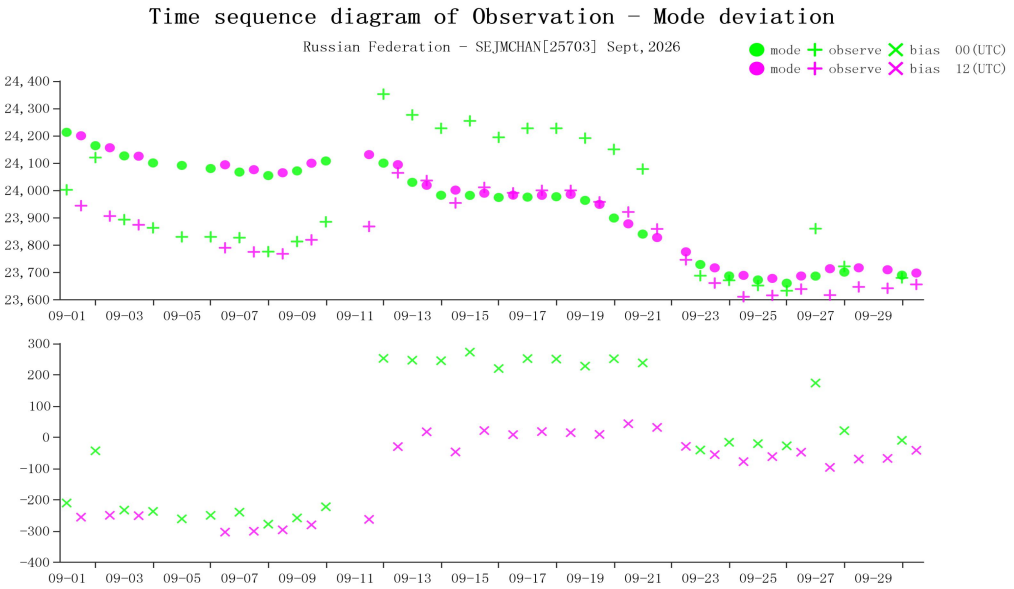


Figure 8 Time-series representation of GPH Obs minus first guess for station 25703*(Level:30)

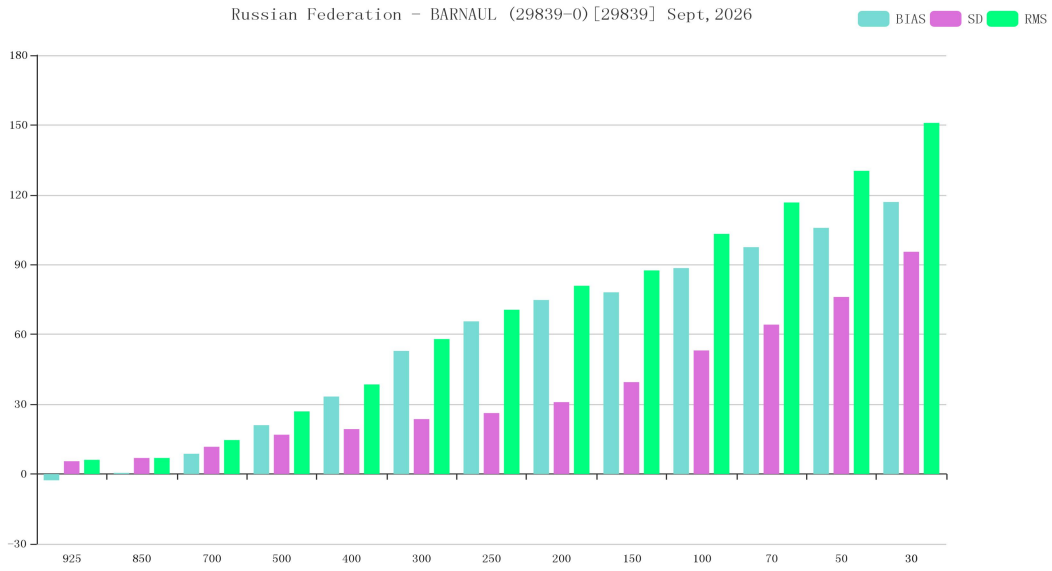


Figure 9 BIAS、SD and RMS of GPH for station 29839*(OBS-TIME:00)

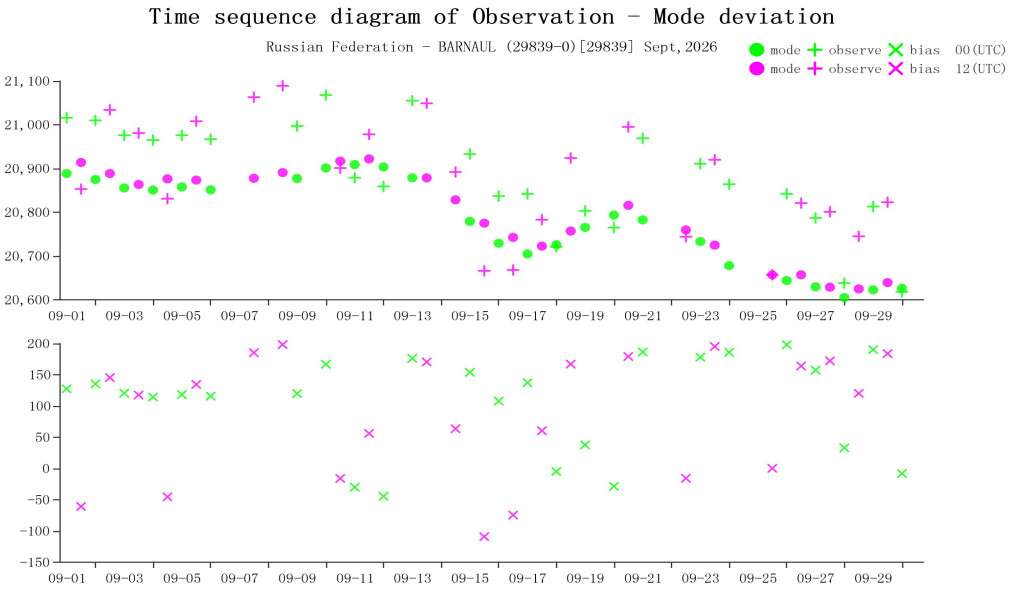


Figure 10 Time-series representation of GPH Obs minus first guess for station 29839*(Level:50)

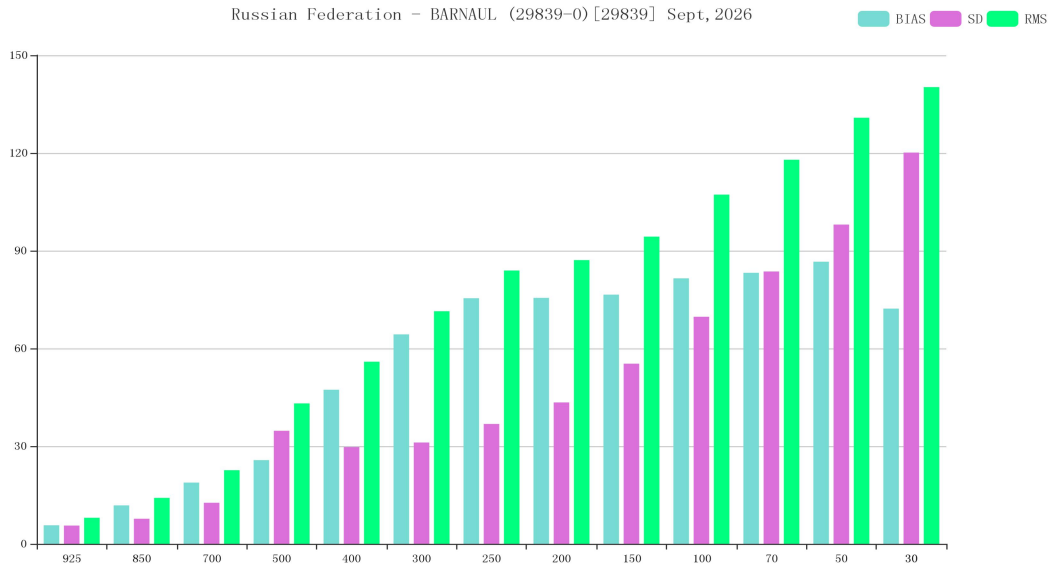


Figure 11 BIAS、SD and RMS of GPH for station 29839*(OBS-TIME:12)

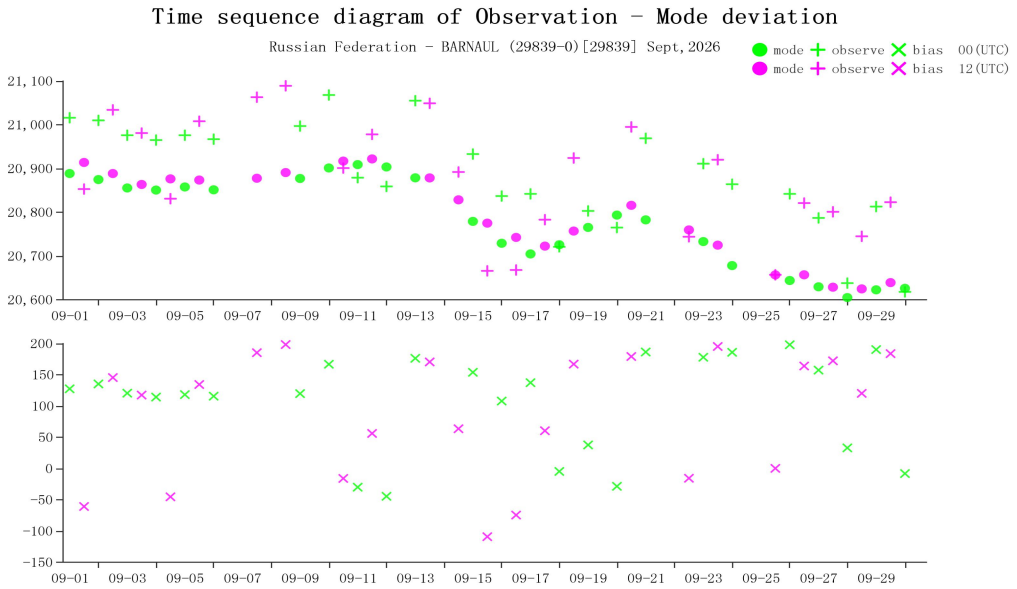


Figure 12 Time-series representation of GPH Obs minus first guess for station 29839*(Level:50)

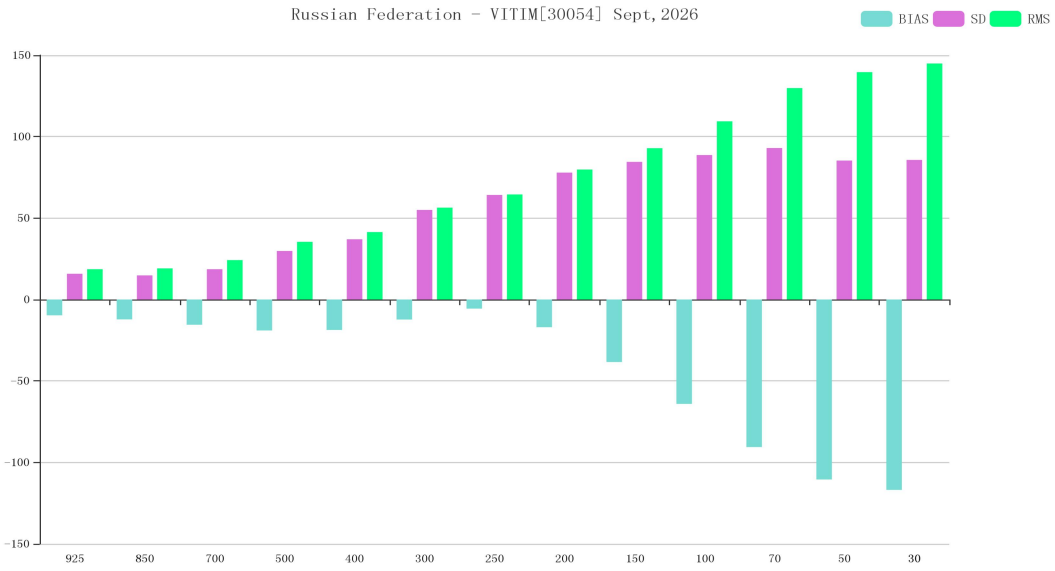


Figure 13 BIAS、SD and RMS of GPH for station 30054*(OBS-TIME:00)

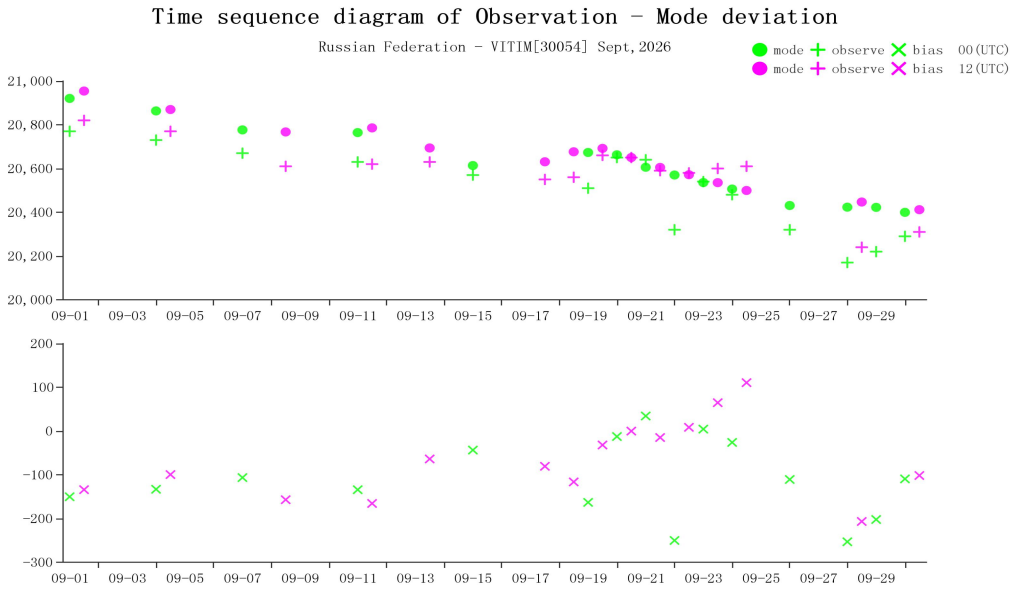


Figure 14 Time-series representation of GPH Obs minus first guess for station 30054*(Level:50)

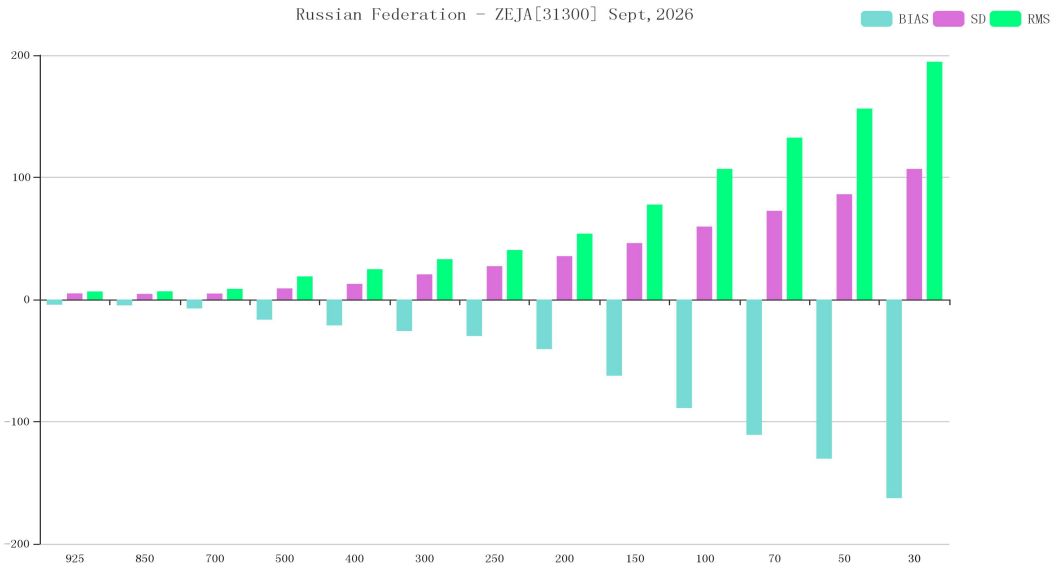


Figure 15 BIAS、SD and RMS of GPH for station 31300*(OBS-TIME:12)

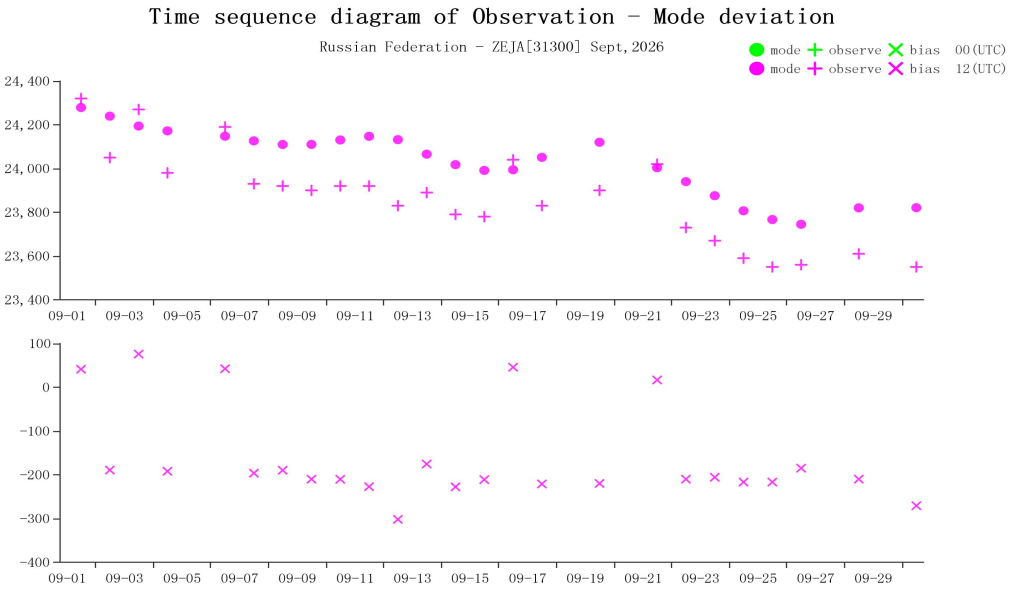


Figure 16 Time-series representation of GPH Obs minus first guess for station 31300*(Level:30)

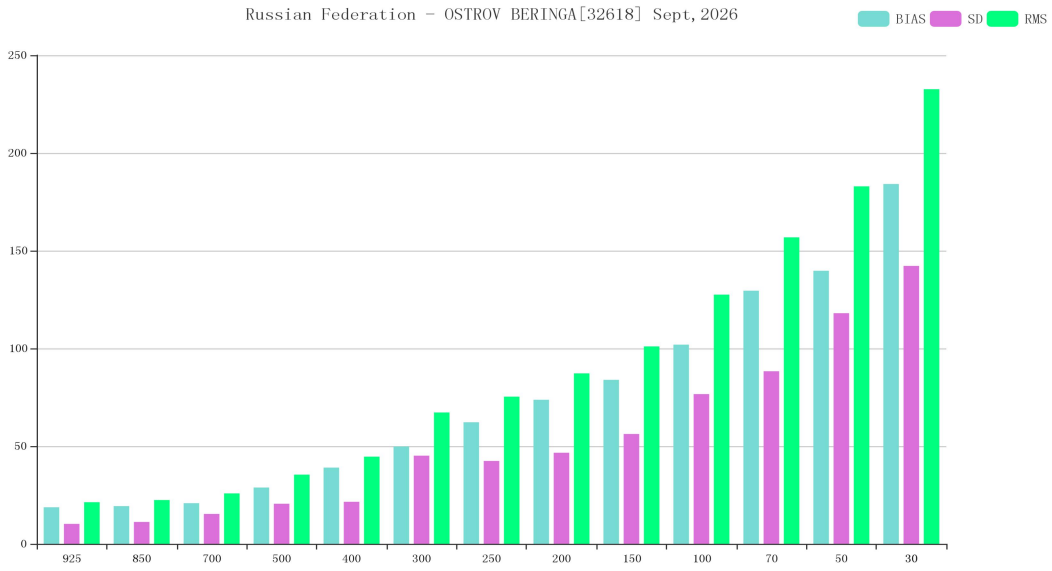


Figure 17 BIAS、SD and RMS of GPH for station 32618*(OBS-TIME:00)

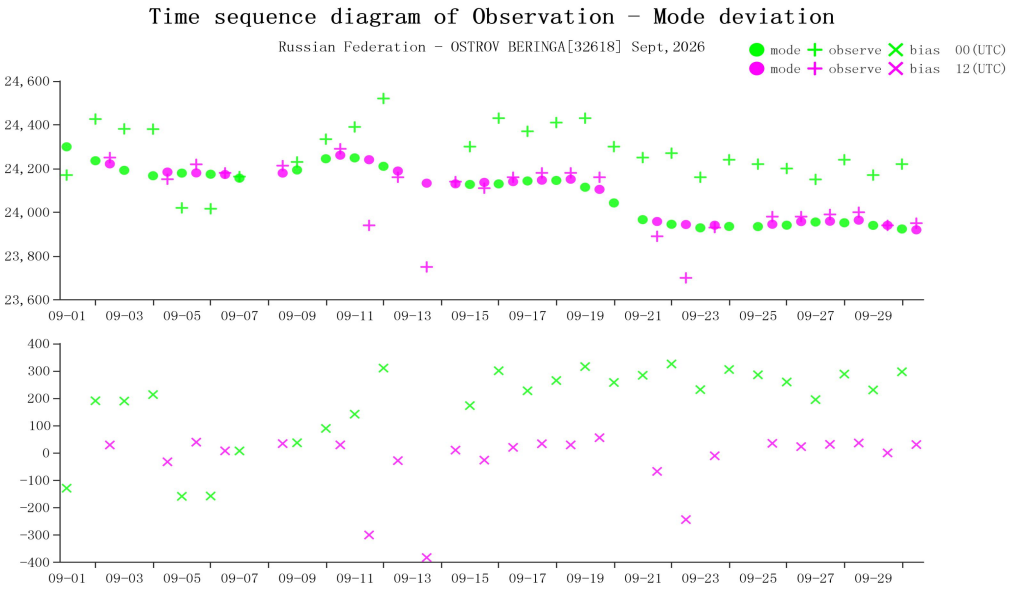


Figure 18 Time-series representation of GPH Obs minus first guess for station 32618*(Level:30)

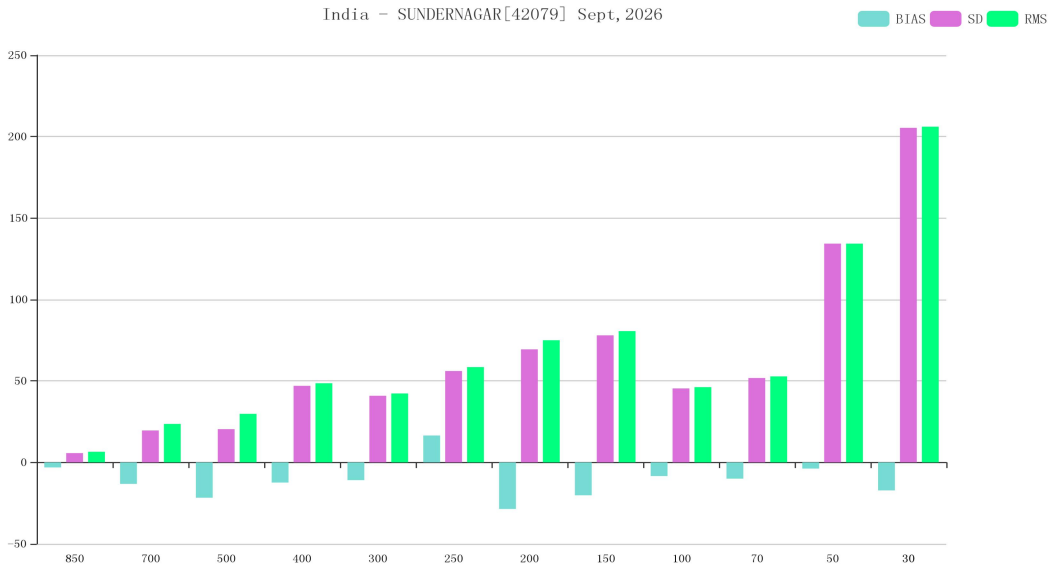


Figure 19 BIAS、SD and RMS of GPH for station 42079(OBS-TIME:00)

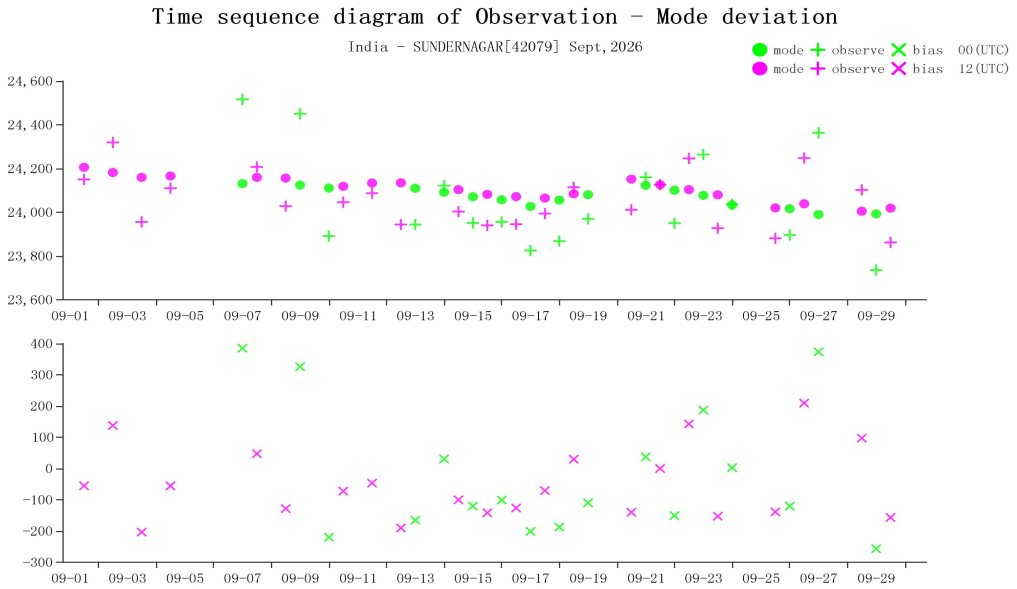


Figure 20 Time-series representation of GPH Obs minus first guess for station 42079(Level:30)

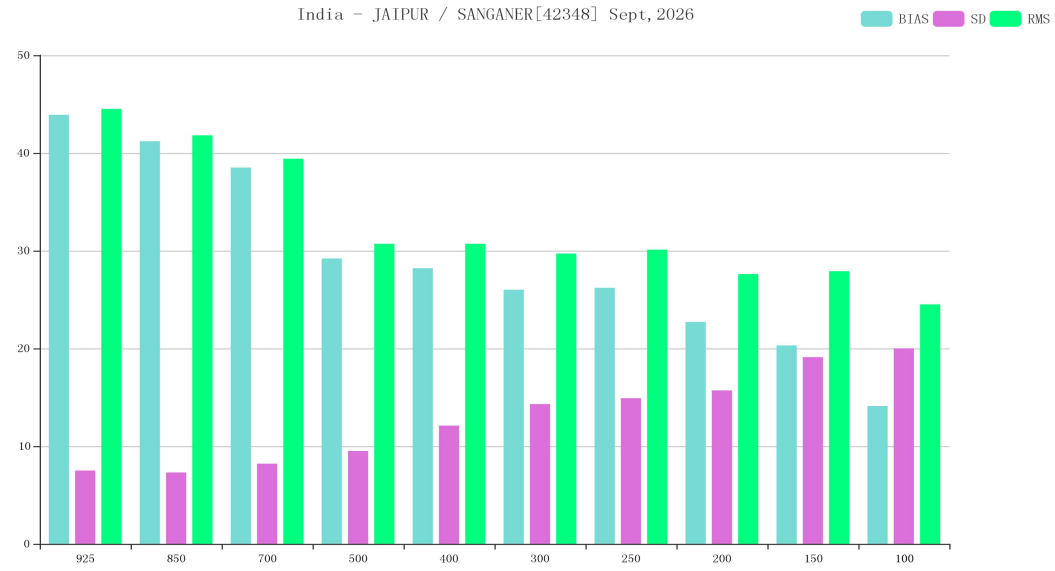


Figure 21 BIAS、SD and RMS of GPH for station 42348(OBS-TIME:00)

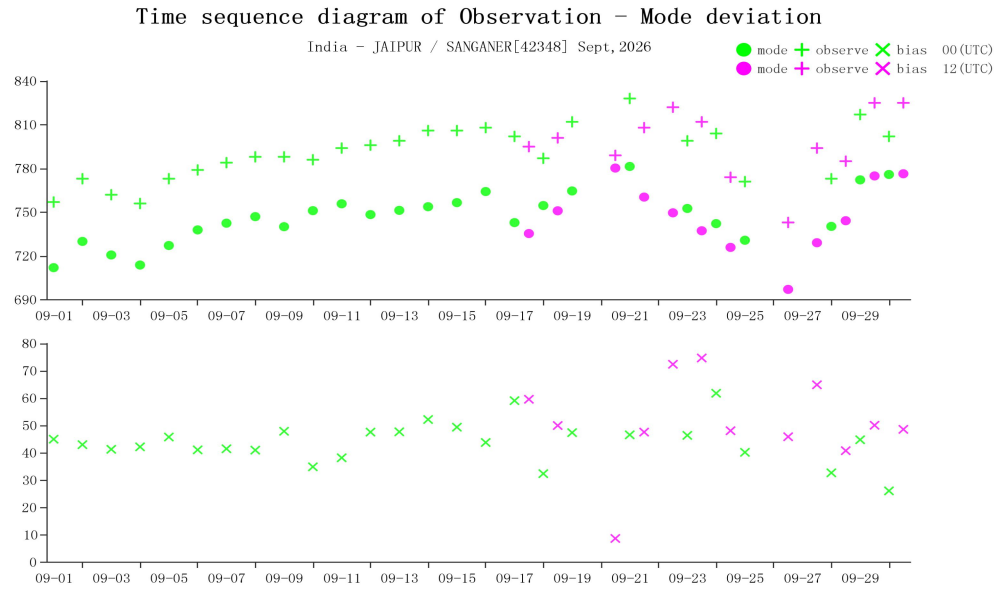


Figure 22 Time-series representation of GPH Obs minus first guess for station 42348(Level:925)

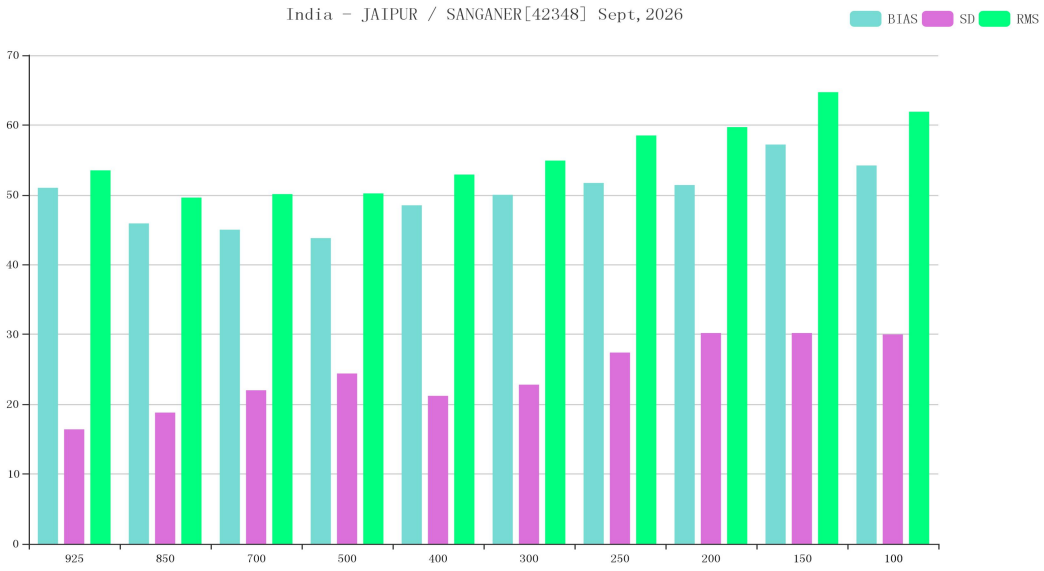


Figure 23 BIAS、SD and RMS of GPH for station 42348(OBS-TIME:12)

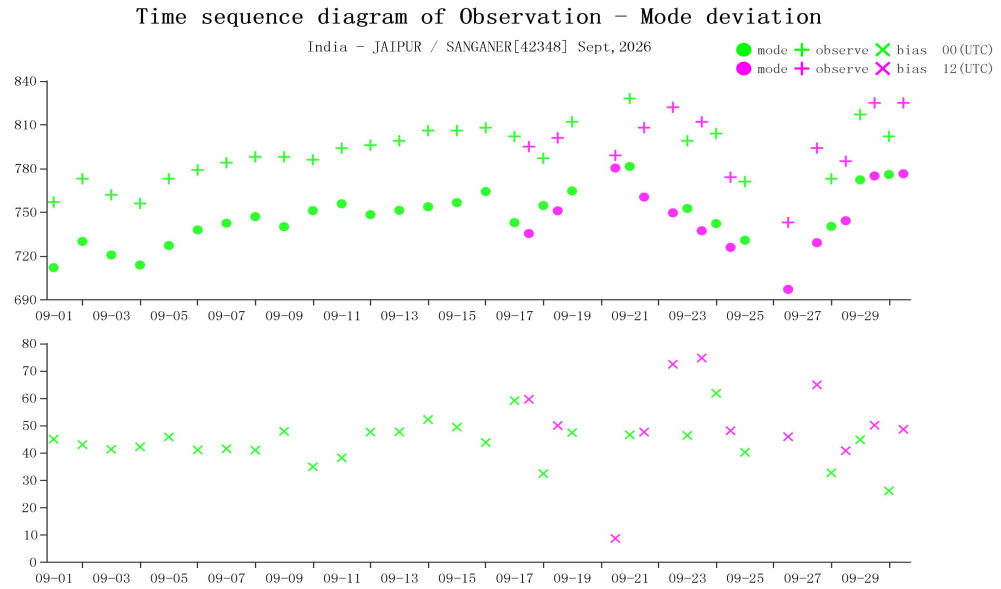


Figure 24 Time-series representation of GPH Obs minus first guess for station 42348(Level:925)

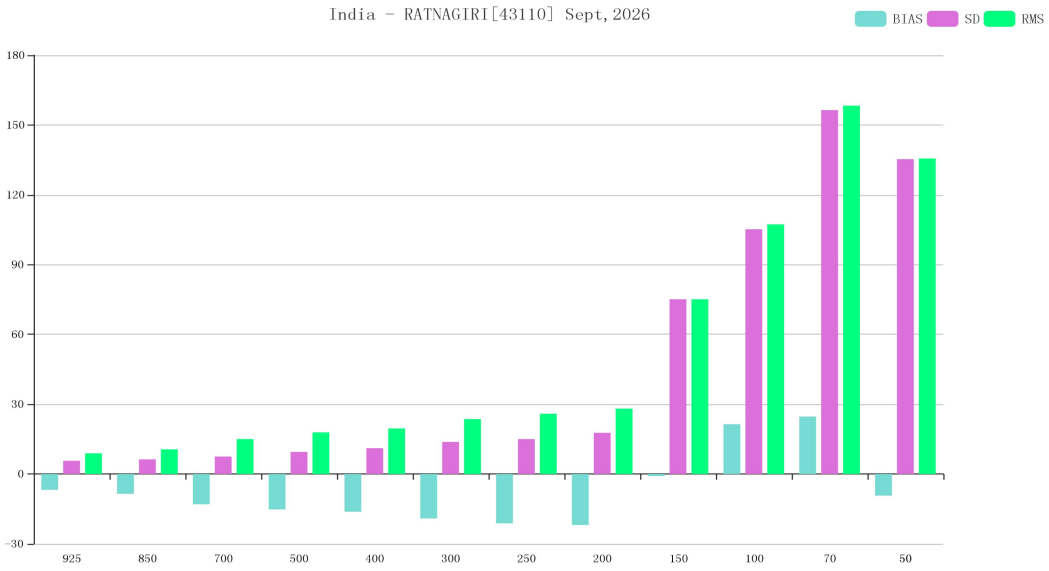


Figure 25 BIAS、SD and RMS of GPH for station 43110(OBS-TIME:12)

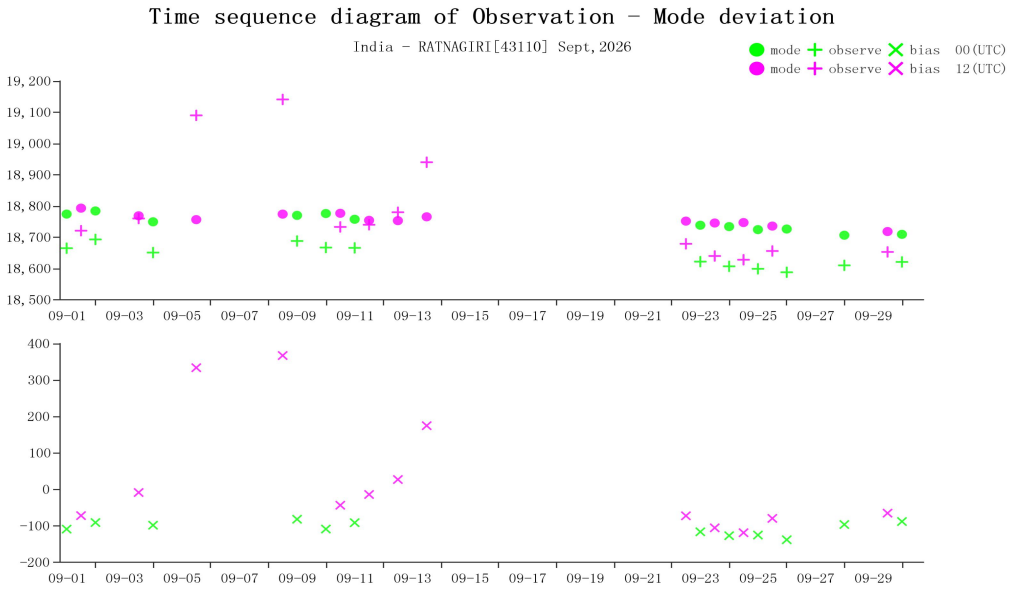


Figure 26 Time-series representation of GPH Obs minus first guess for station 43110(Level:70)

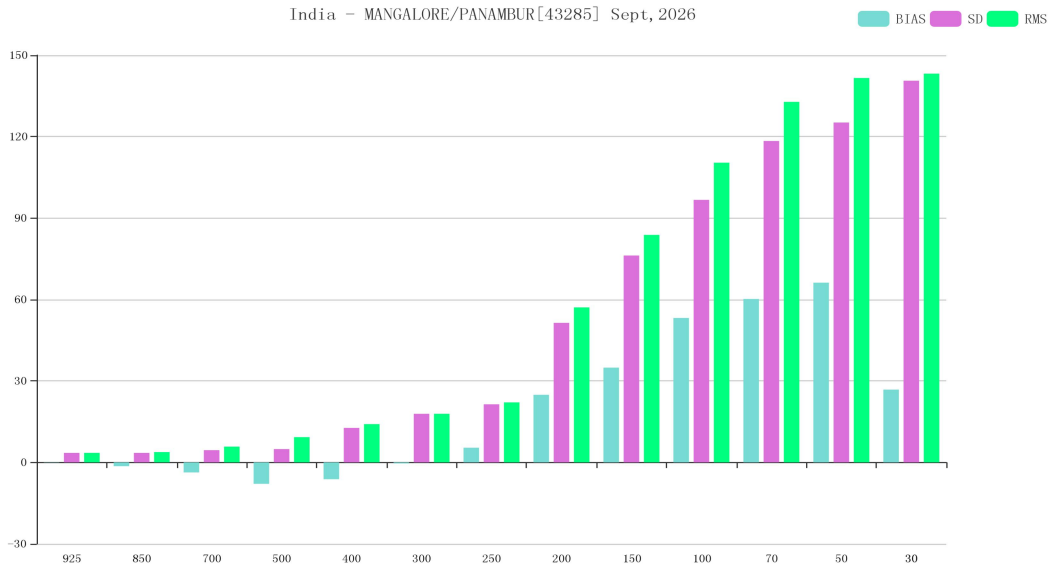


Figure 27 BIAS、SD and RMS of GPH for station 43285(OBS-TIME:00)

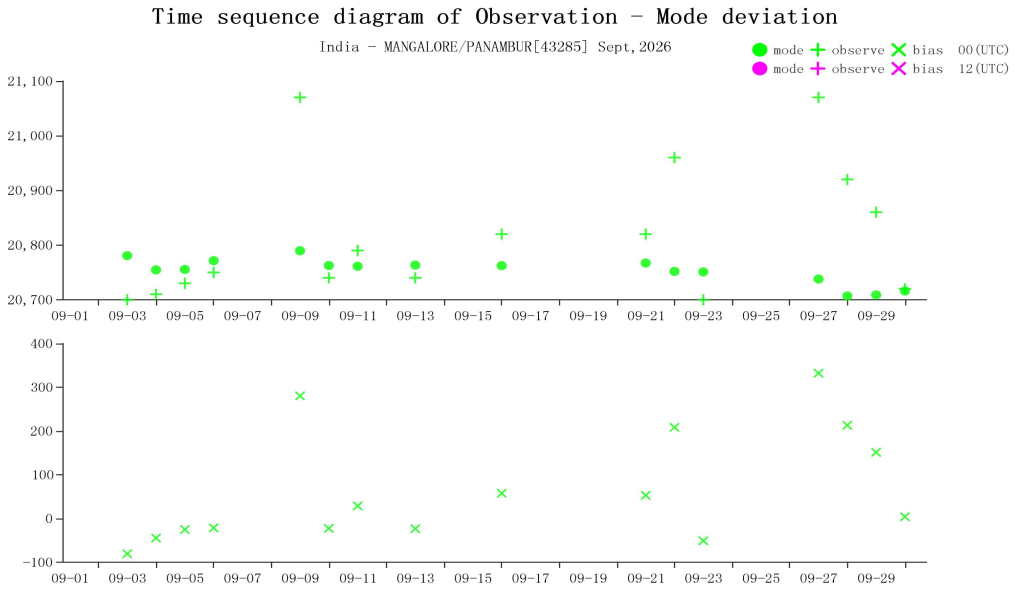


Figure 28 Time-series representation of GPH Obs minus first guess for station 43285(Level:50)

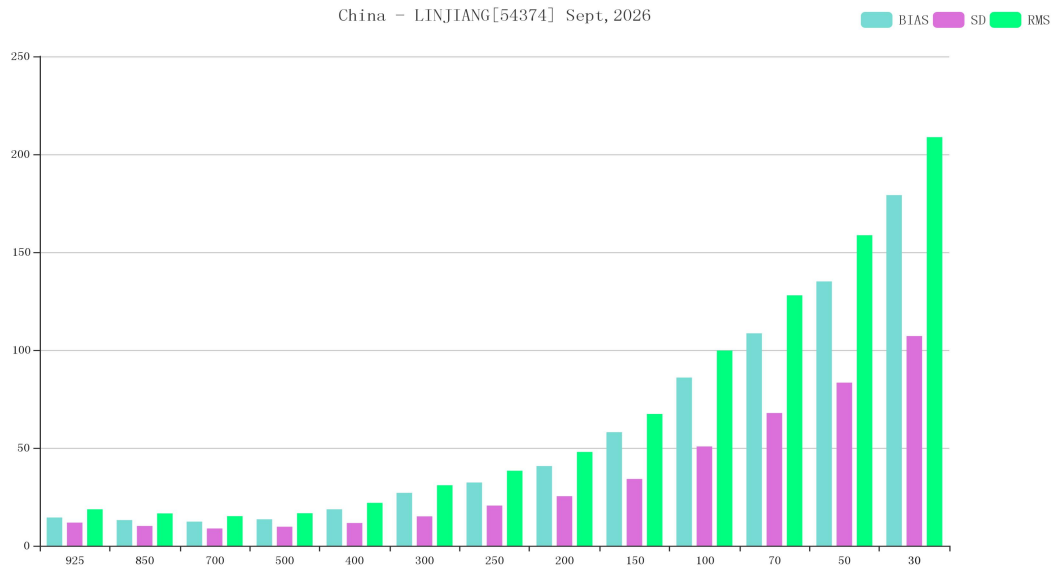


Figure 29 BIAS、SD and RMS of GPH for station 54374(OBS-TIME:00)

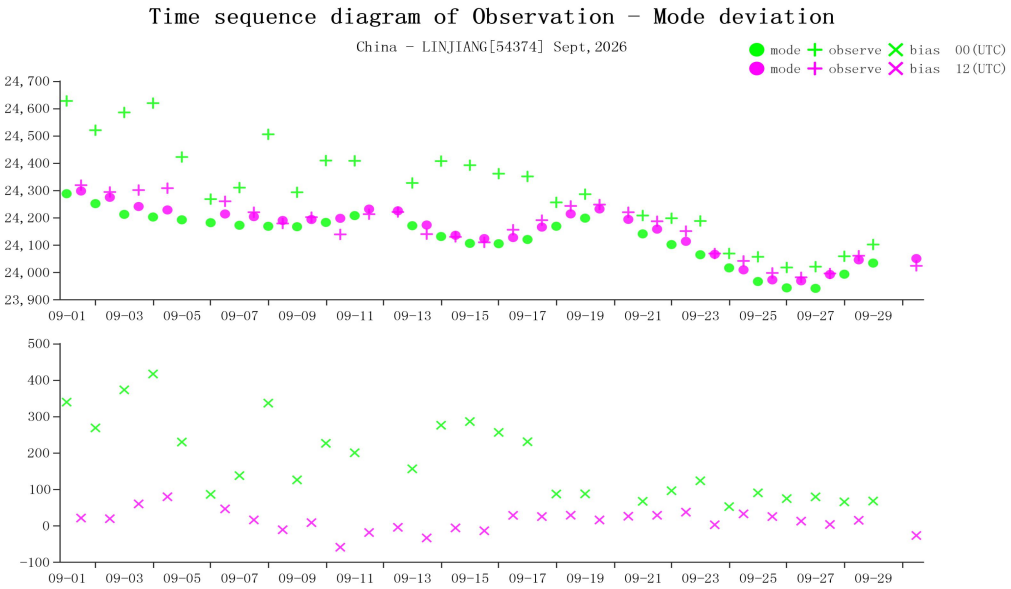


Figure 30 Time-series representation of GPH Obs minus first guess for station 54374(Level:30)

3.3 Vector Wind (WIN_S)

3.3.1 List of Suspect Stations

No suspect stations.

3.3.2 Station Analysis

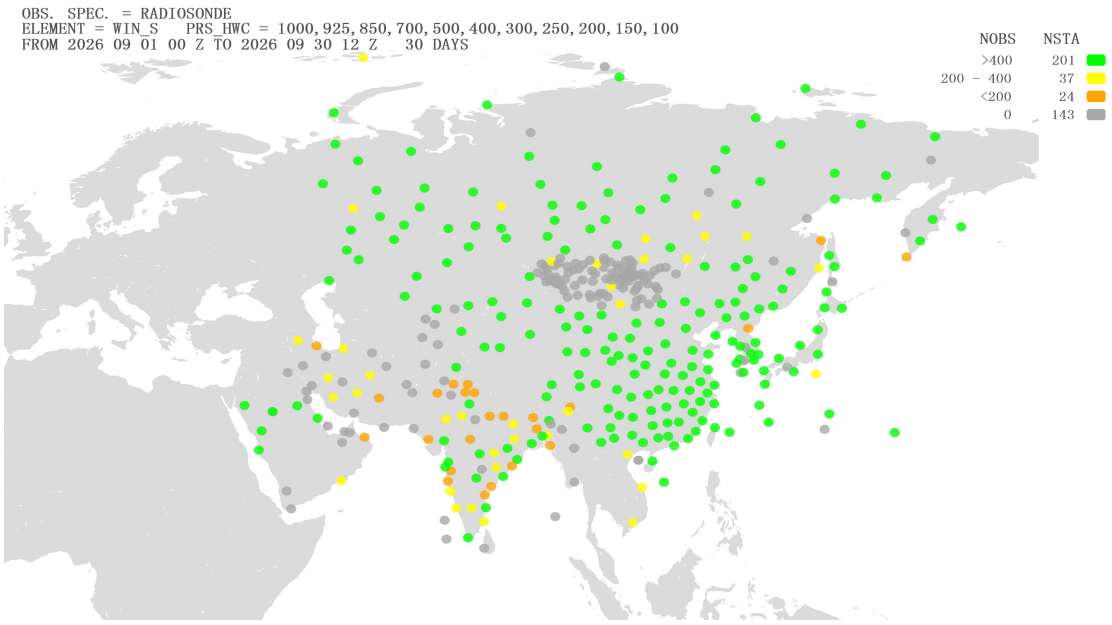


Figure 31 Location of all radiosonde stations reporting vector wind observations in Region II over the month of September 2026. NOBS shows the total number of observations received at RWC-Beijing, corresponding total number of stations (NSTA) and color scale are shown at the top of the figure, color green refers to NOBS is higher than 400, color yellow refers to NOBS is between 200 and 400(including 400), color orange refers to NOBS is between 0 and 200(including 200), and color gray refers to NOBS is 0

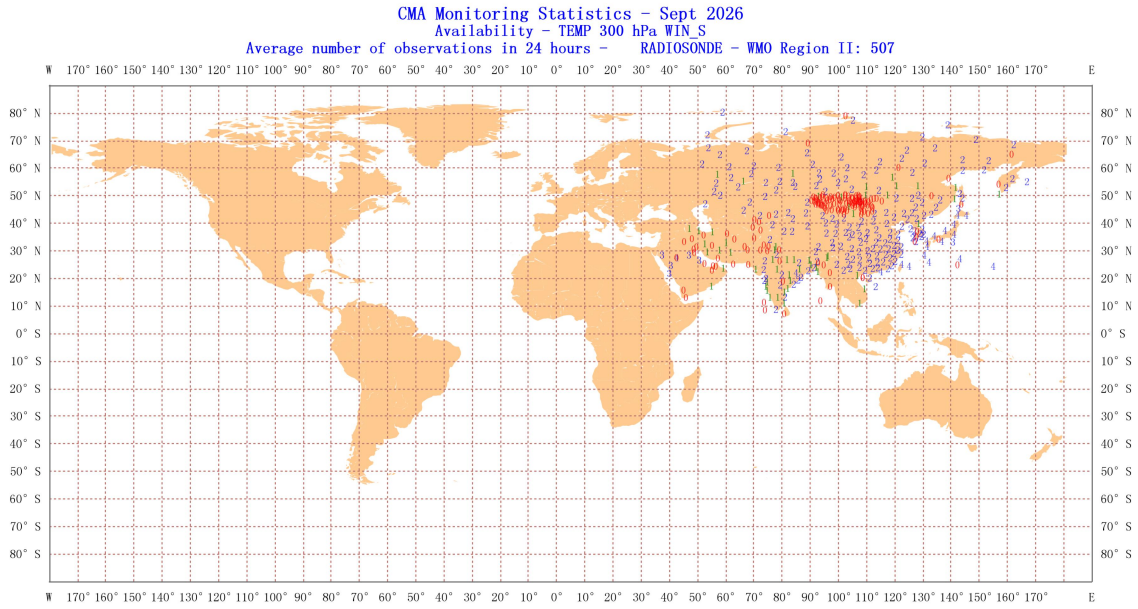


Figure 32 Location of all radiosonde stations reporting vector wind average number of observations in 24 hours in Region II over the month of September 2026

3.4 Wind Direction (WIN_D)

3.4.1 List of Suspect Stations

No suspect stations.

3.4.2 Station Analysis

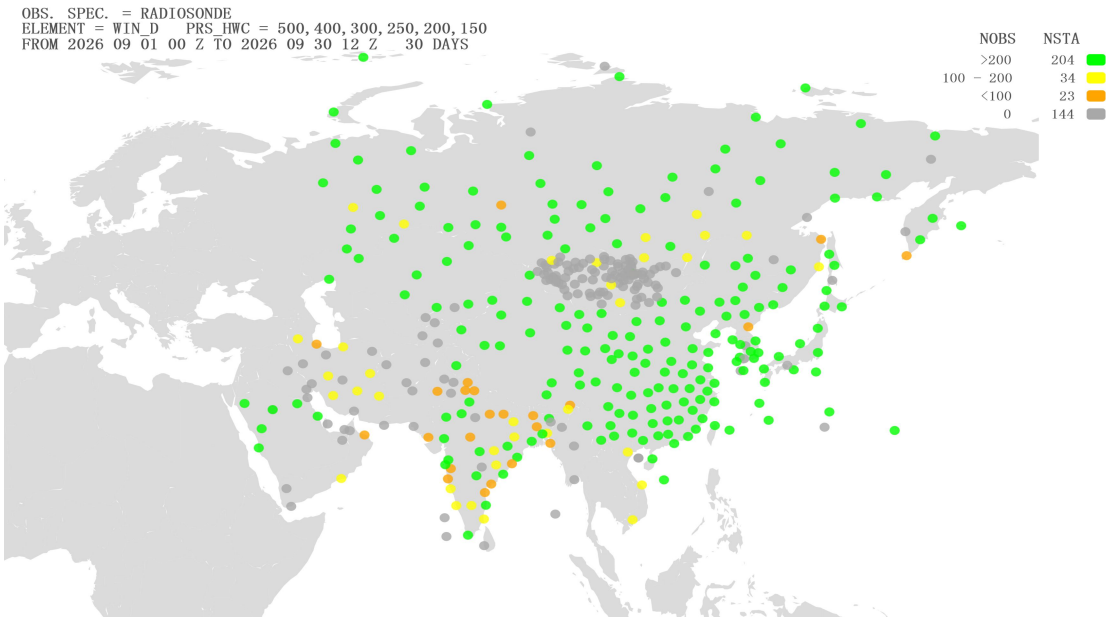


Figure 33 Location of all radiosonde stations reporting wind direction observations in Region II over the month of September 2026. NOBS shows the total number of observations received at RWC-Beijing, corresponding total number of stations (NSTA) and color scale are shown at the top of the figure, color green refers to NOBS is higher than 200, color yellow refers to NOBS is between 100 and 200(including 200), color orange refers to NOBS is between 0 and 100(including 100), and color gray refers to NOBS is 0

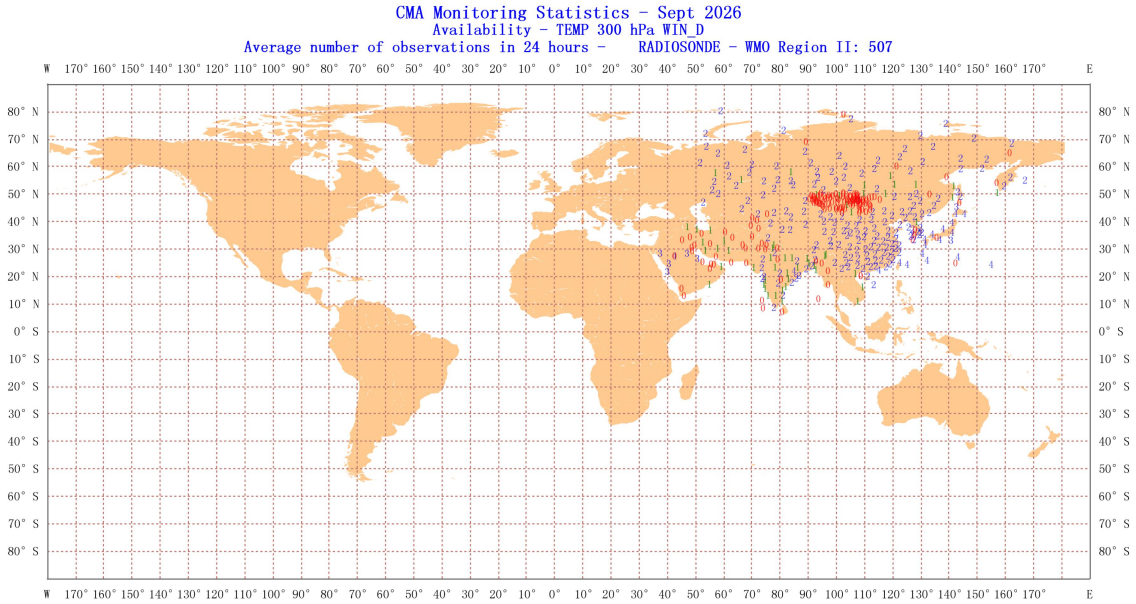


Figure 34 Location of all radiosonde stations reporting wind direction average number of observations in 24 hours in Region II over the month of September 2026

4. Comparison with Other Results

Element	CMA				EC				JMA			
	Member	Station	Time	Level	Member	Station	Time	Level	Member	Station	Time	Level
Geopotential Height					Russian Federation	23933	00	250	Russian Federation	23933	00	250
					Russian Federation	23933	12	250				
	Russian Federation	23955	12	50	Russian Federation	23955	12	200	Russian Federation	23955	12	200
	Russian Federation	25703	00	30	Russian Federation	25703	00	30	Russian Federation	25703	00	30
					Russian Federation	25703	12	50	Russian Federation	25703	12	50
									Russian Federation	25913	12	50
	Russian Federation	29839	00	50	Russian Federation	29839	00	200	Russian Federation	29839	00	200
	Russian Federation	29839	12	50	Russian Federation	29839	12	250	Russian Federation	29839	12	250
	Russian Federation	30054	00	50	Russian Federation	30054	00	70	Russian Federation	30054	00	70
	Russian Federation	31300	12	30	Russian Federation	31300	12	50	Russian Federation	31300	12	30
	Russian Federation	32618	00	30	Russian Federation	32618	00	30	Russian Federation	32618	00	30
	India	42079	00	30								
	India	42348	00	925	India	42348	00	925				
	India	42348	12	925	India	42348	12	925				
	India	43110	12	70								
	India	43285	00	50	India	43285	00	70	India	43285	00	70
	China	54374	00	30					China	54374	00	30
Vector Wind												
Wind Direction									India	43049	00	

5. Possible Causes of Remarkable Biases

The following are possible causes of remarkable and sustained biases:

(1) The radiosonde has significant error.

(2) 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.

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

Technical Support

Any comments on the contents and the format of the report are welcome and should be contacted to:

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