Radiosonde-No.10-MOC-CMA(2025)

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

October 2025

Regional WIGOS Centre, Beijing

China Meteorological Administration

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Contents

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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 October 2025. 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 October

INDEX	STATION_CODE	STATION_NAME	MEMBER	LAT	LON
1	24944	OLEKMINSK (24944-1)	Russian Federation	60.37	120.42
2	31168	AYAN	Russian Federation	56.45	138.15
3	32150*	JUZHNO-SAHALINSK	Russian Federation	46.95	142.72
4	38507	TURKMENBASHI (38507-1)	Turkmenistan	40.03	52.98
5	38836	DUSHANBE	Tajikistan	38.58	68.73
6	38954	KHOROG	Tajikistan	37.50	71.50
7	40650	BAGHDAD INT. AIRPORT	Iraq	33.30	44.40
8	40938	HERAT	Afghanistan	34.22	62.22
9	40948	KABUL AIRPORT	Afghanistan	34.55	69.22
10	41594	SARGODHA (41594-0)	Pakistan	32.05	72.67
11	41661	QUETTA (SHEIKH MANDA)	Pakistan	30.27	66.92
12	43041	JAGDALPUR	India	19.08	82.03
13	43285	MANGALORE/PANAMBUR	India	12.95	74.83
14	43311	AMINIDIVI	India	11.12	72.73
15	43333	PORT BLAIR	India	11.67	92.72
16	43369	MINICOY	India	8.28	73.06
17	47418*	KUSHIRO (47418-1)	Japan	42.95	144.44
18	47600*	WAJIMA	Japan	37.39	136.90

19	48042*	MANDALAY	Myanmar	21.94	96.09
20	48097*	YANGON	Myanmar	16.86	96.15

This list includes the non-reporting stations with operational status during October, 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 October 2025

INDEX	STATION_CODE	MEMBER	OBS TIME	LEVEL	NUM OBS	NUM GRS	REJ（%）	BIAS	SD	RMS
1	25703*	Russian Federation	12	30	26	0	0	88.7	131.6	158.7
2	25913*	Russian Federation	00	70	12	0	0	116	93.3	148.9
3	25913*	Russian Federation	12	70	12	0	0	113.3	83.6	140.8
4	31770*	Russian Federation	00	70	30	0	0	82.9	106.4	134.9
5	40811*	Iran, Islamic Republic of	12	30	14	4	0	144.8	87.7	169.3
6	42348	India	00	925	25	0	0	43	5.6	43.3
7	43295	India	00	70	15	0	0	-91.6	94.2	131.4

3.2.2 Suspect Station Analysis

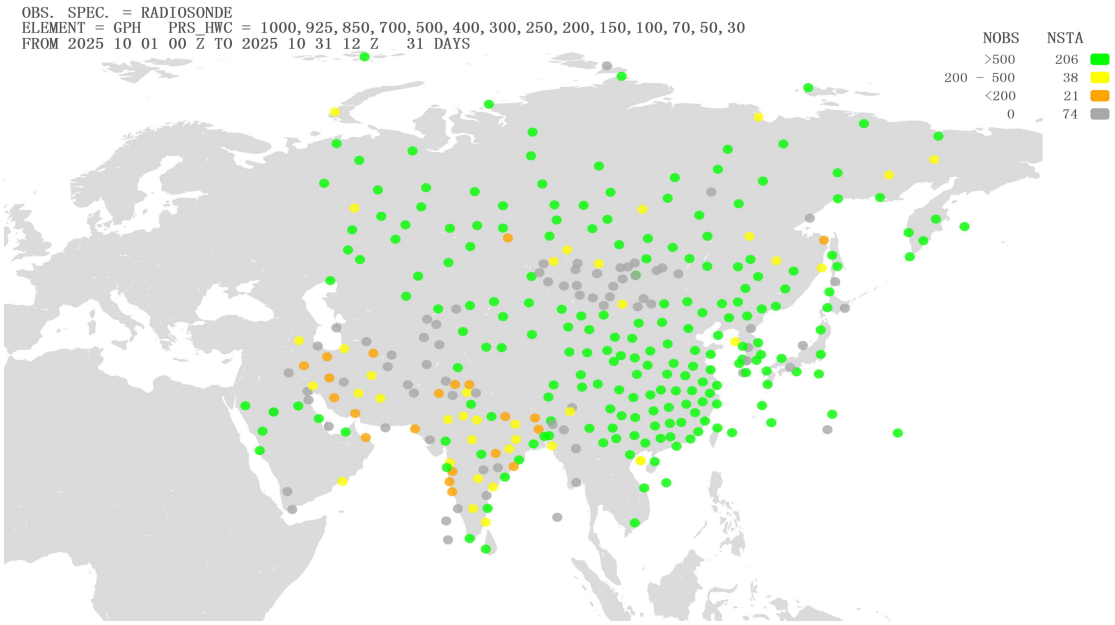

Figure 1 Location of all radiosonde stations reporting geopotential height observations in Region II over the month of October 2025. NOBS shows the total number of observations received at RWC-Beijing, corresponding total number of stations (NSTA) and color scale are shown at the top of the figure, color 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

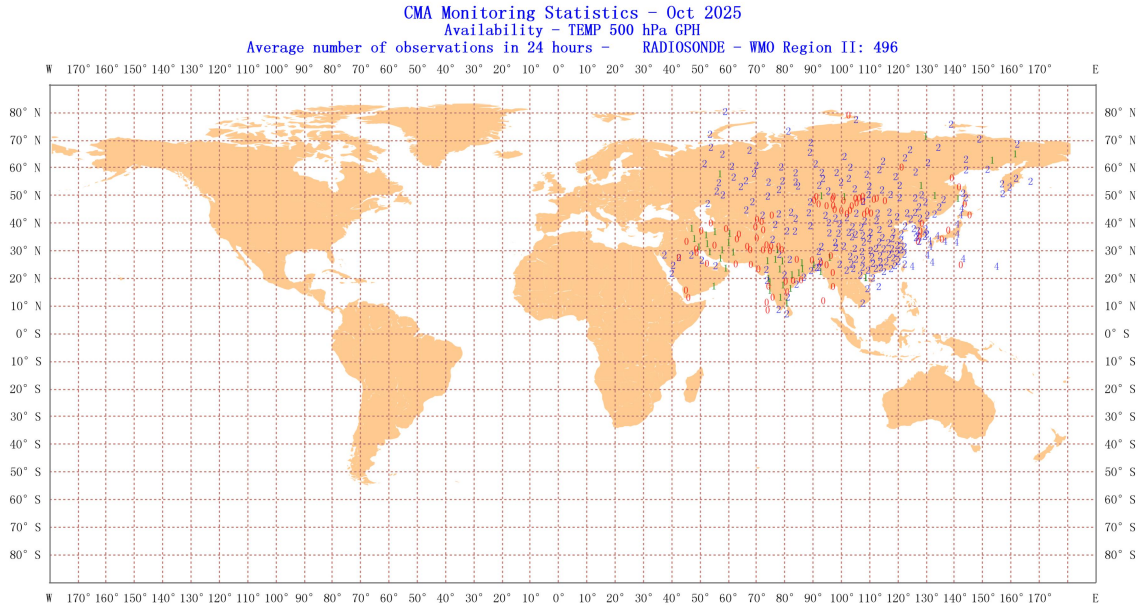

Figure 2 Location of all radiosonde stations reporting geopotential height average number of observations in 24 hours in Region II over the month of October 2025

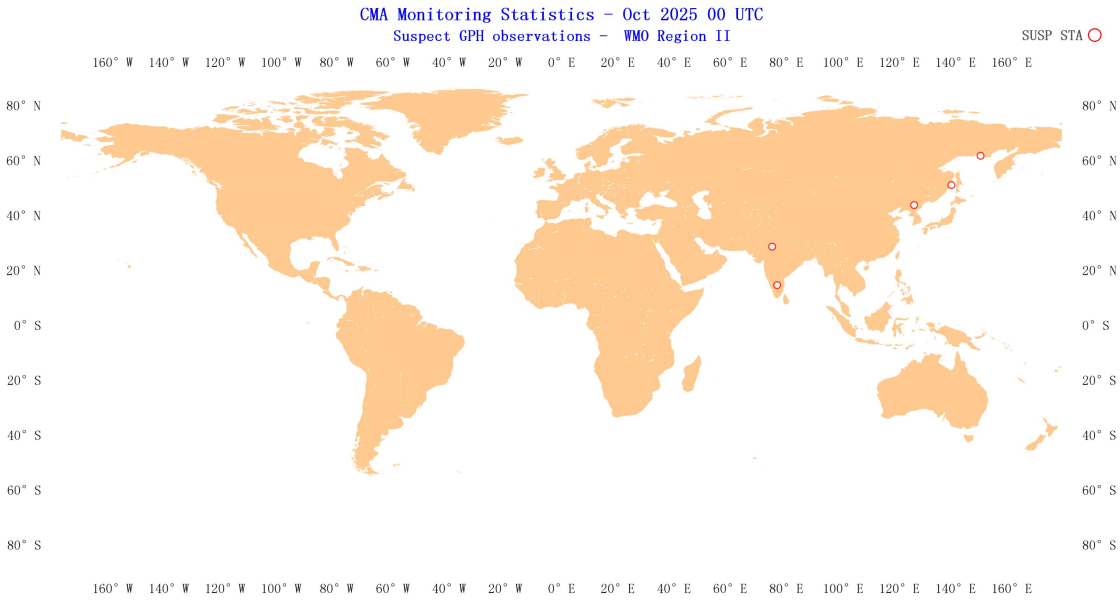

Figure 3 Distribution of suspect stations - Geopotential Height 00 UTC

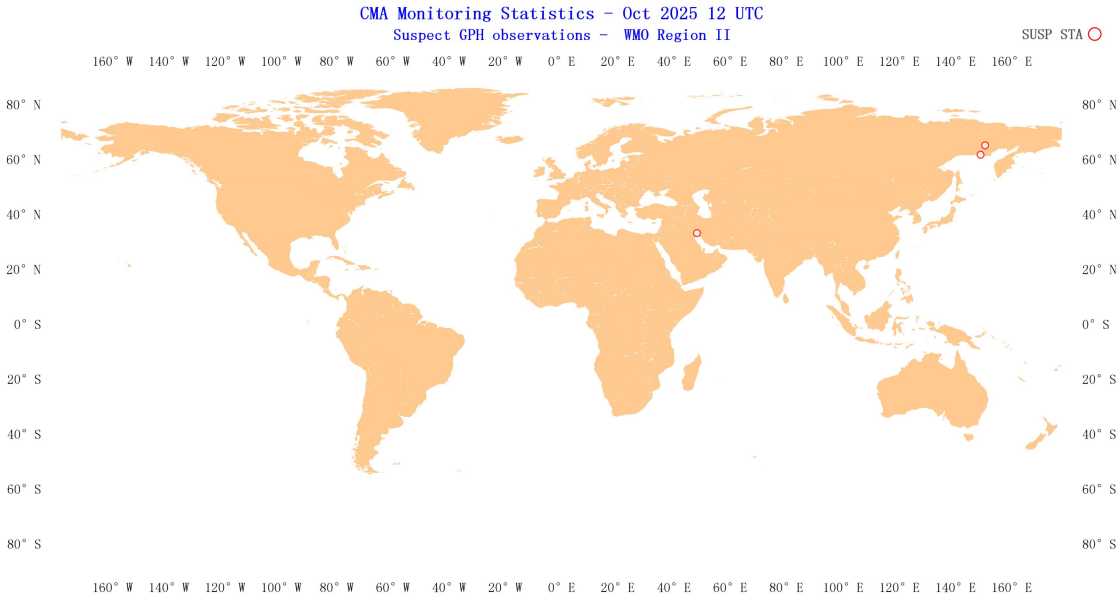

Figure 4 Distribution of suspect stations - Geopotential Height 12 UTC

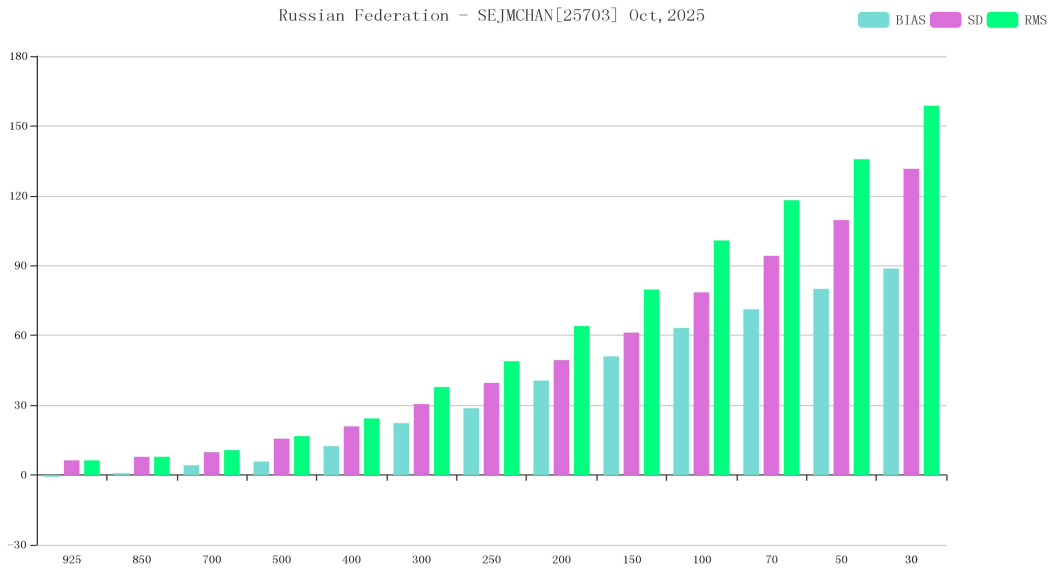

Figure 5 BIAS、SD and RMS of GPH for station 25703*(OBS-TIME:12)

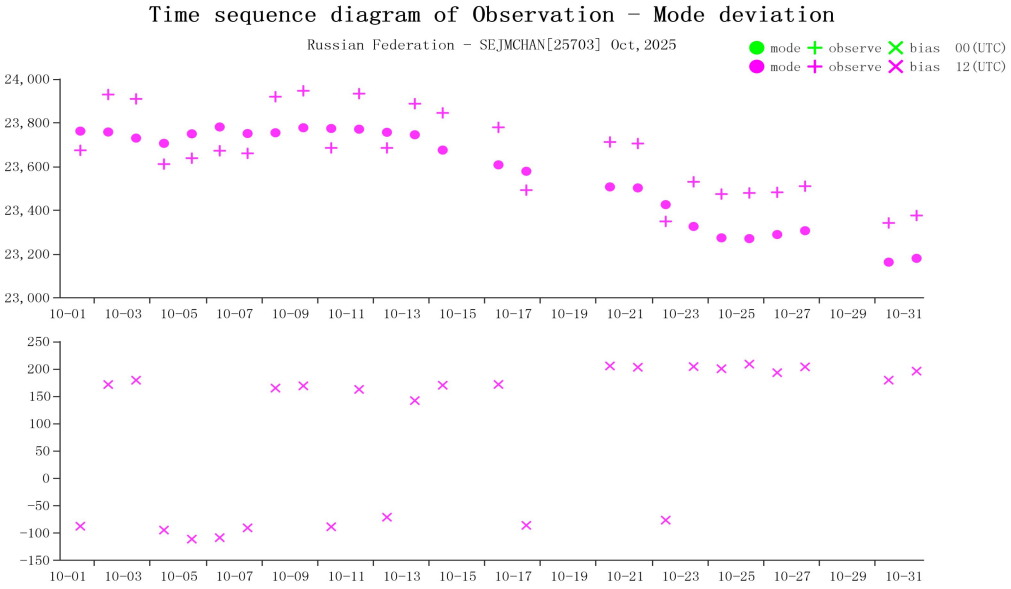

Figure 6 Time-series representation of GPH Obs minus first guess for station 25703*(Level:30)

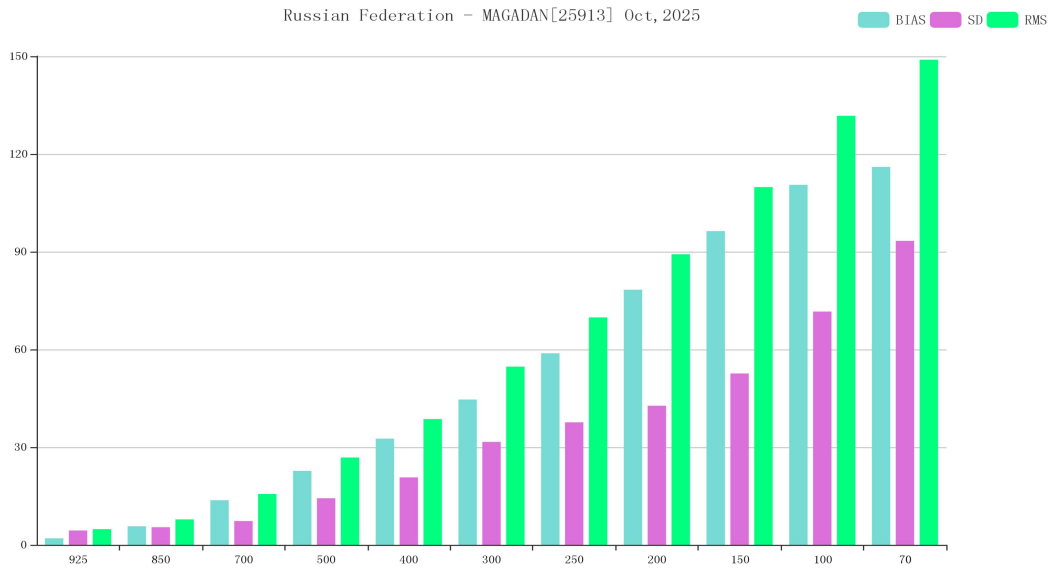

Figure 7 BIAS、SD and RMS of GPH for station 25913*(OBS-TIME:00)

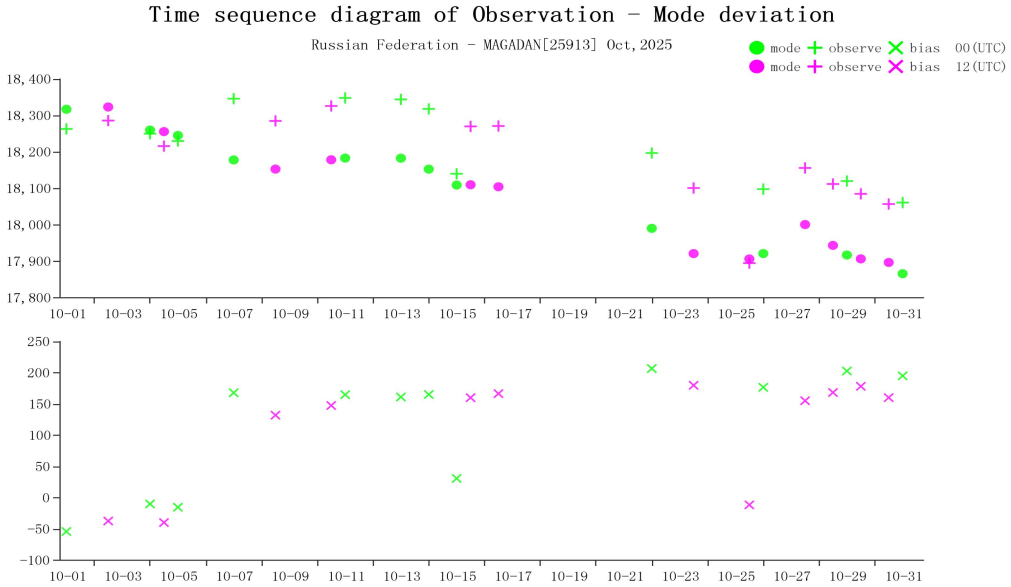

Figure 8 Time-series representation of GPH Obs minus first guess for station 25913*(Level:70)

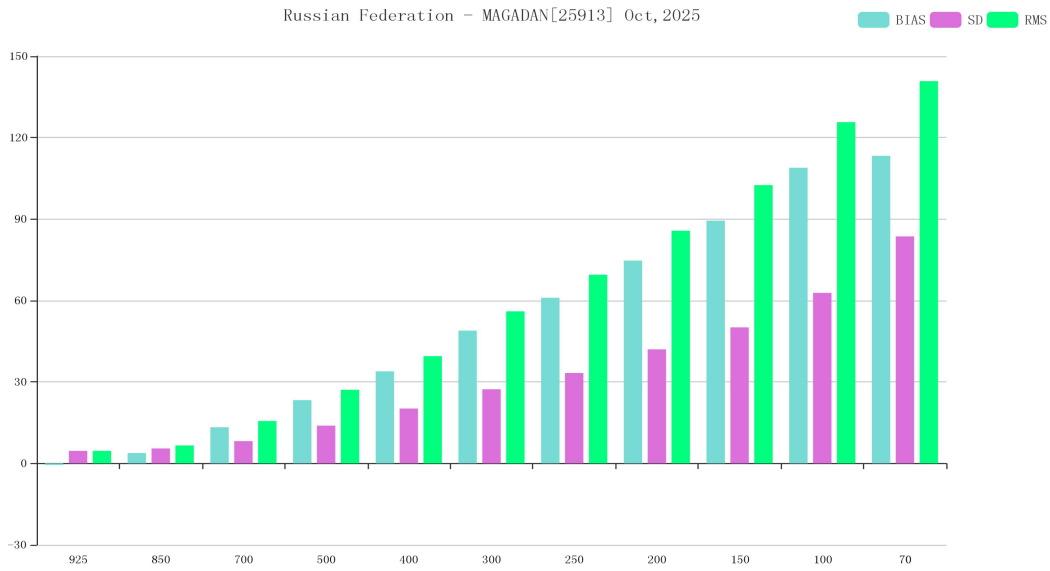

Figure 9 BIAS、SD and RMS of GPH for station 25913*(OBS-TIME:12)

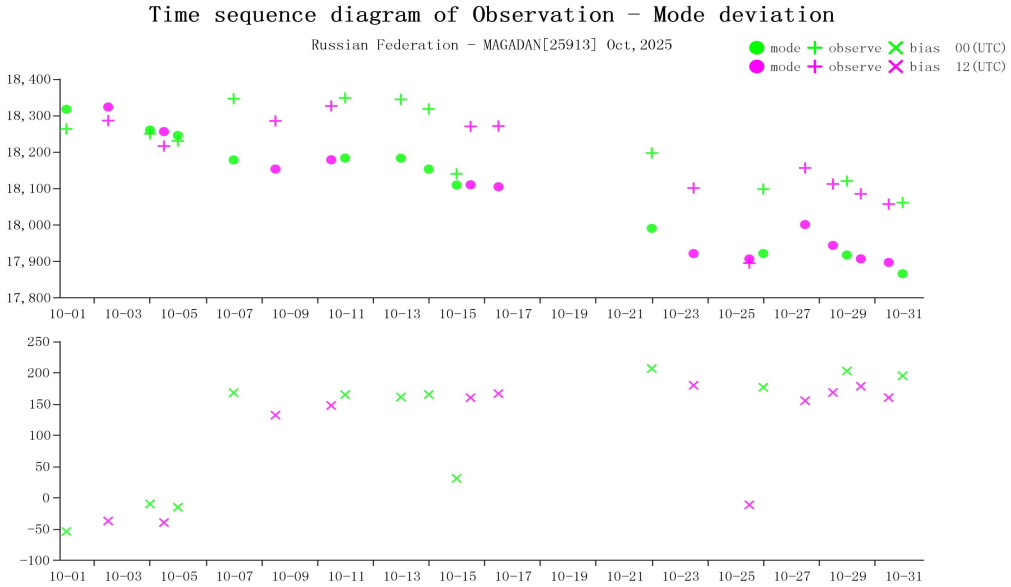

Figure 10 Time-series representation of GPH Obs minus first guess for station 25913*(Level:70)

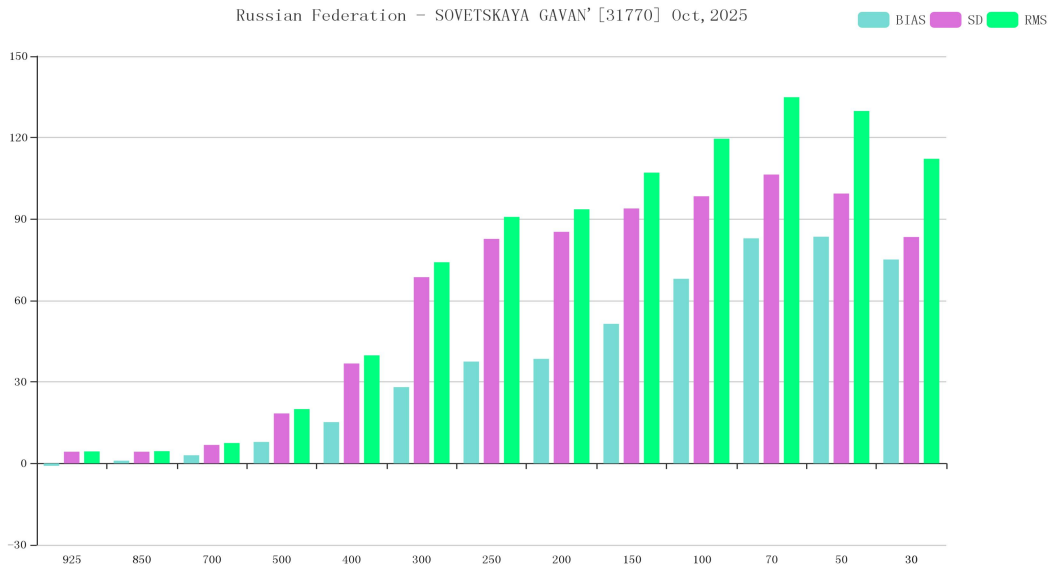

Figure 11 BIAS、SD and RMS of GPH for station 31770*(OBS-TIME:00)

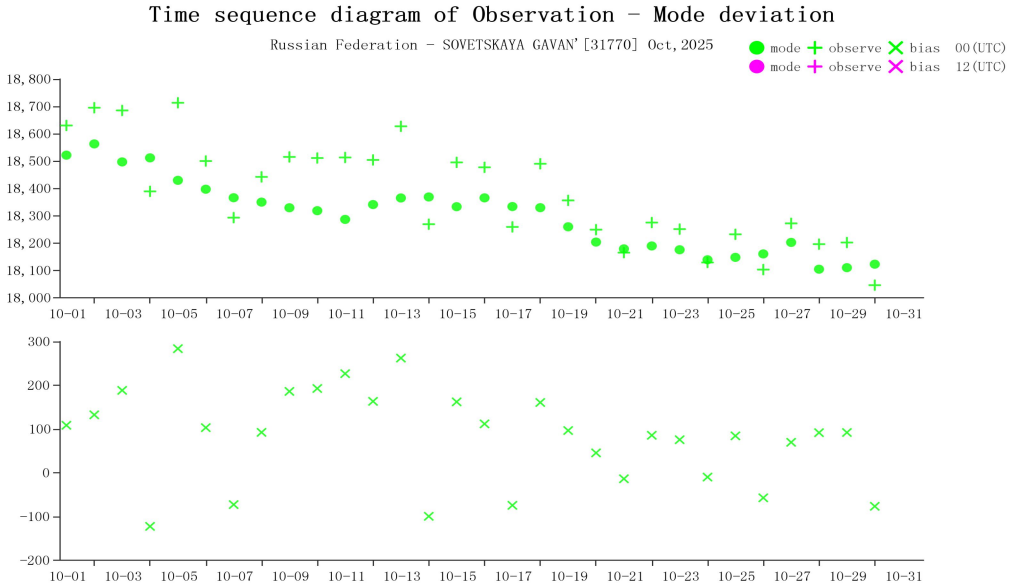

Figure 12 Time-series representation of GPH Obs minus first guess for station 31770*(Level:70)

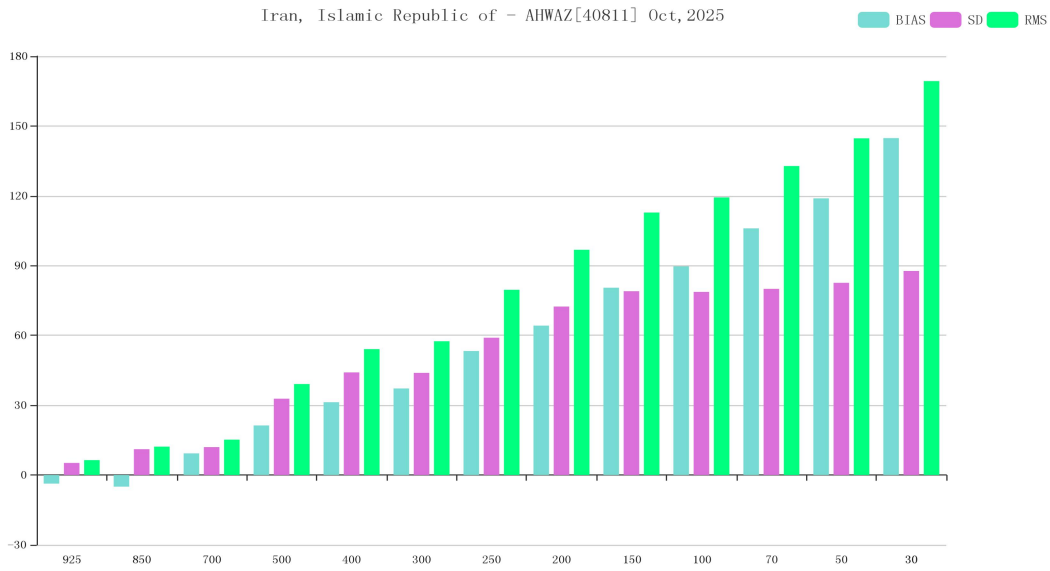

Figure 13 BIAS、SD and RMS of GPH for station 40811*(OBS-TIME:12)

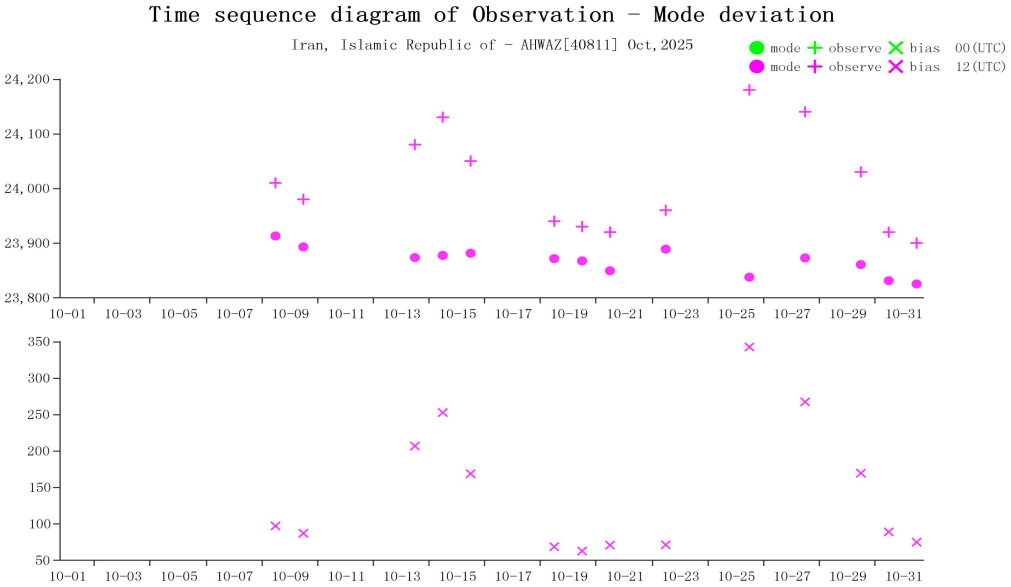

Figure 14 Time-series representation of GPH Obs minus first guess for station 40811*(Level:30)

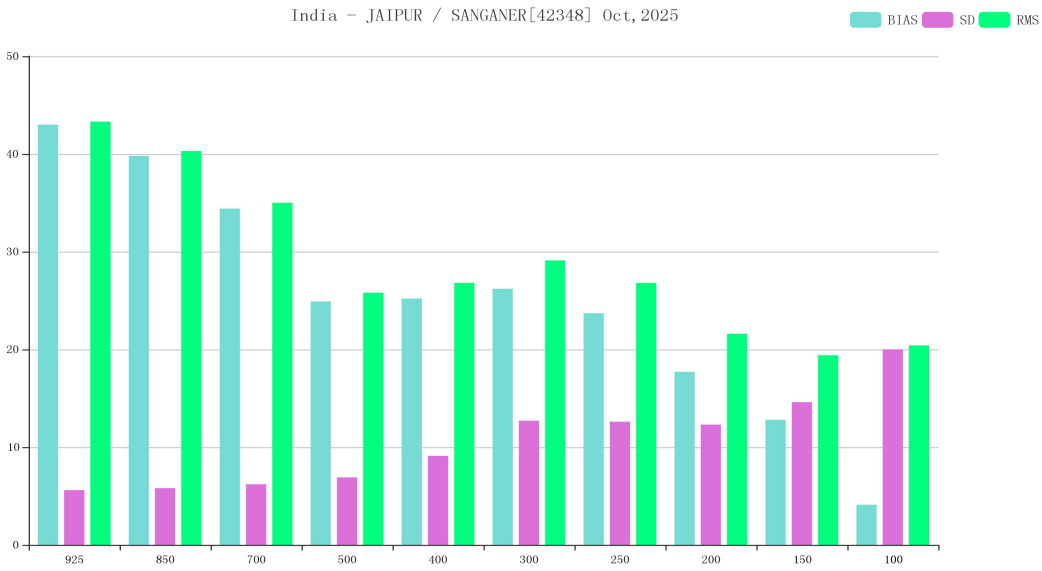

Figure 15 BIAS、SD and RMS of GPH for station 42348(OBS-TIME:00)

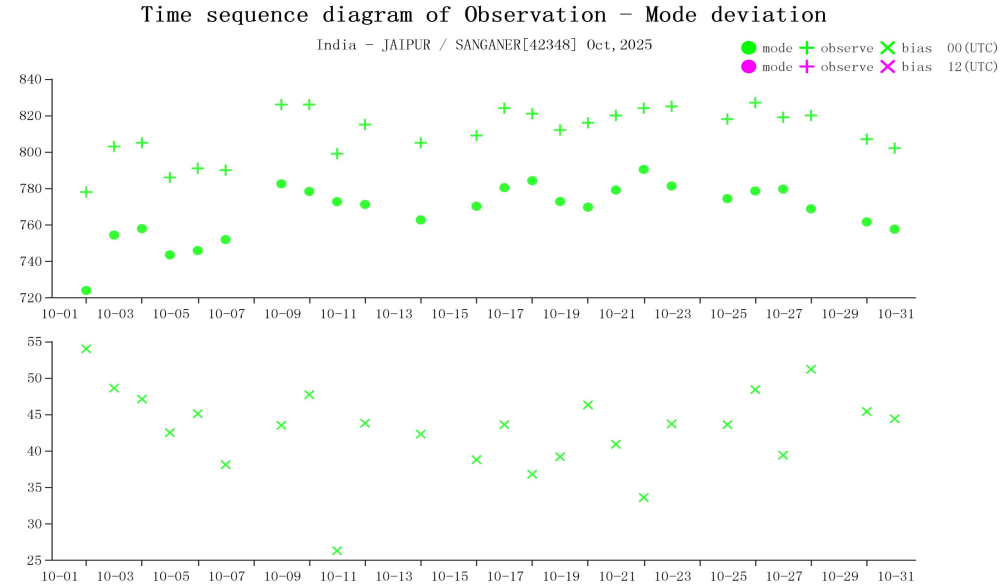

Figure 16 Time-series representation of GPH Obs minus first guess for station 42348(Level:925)

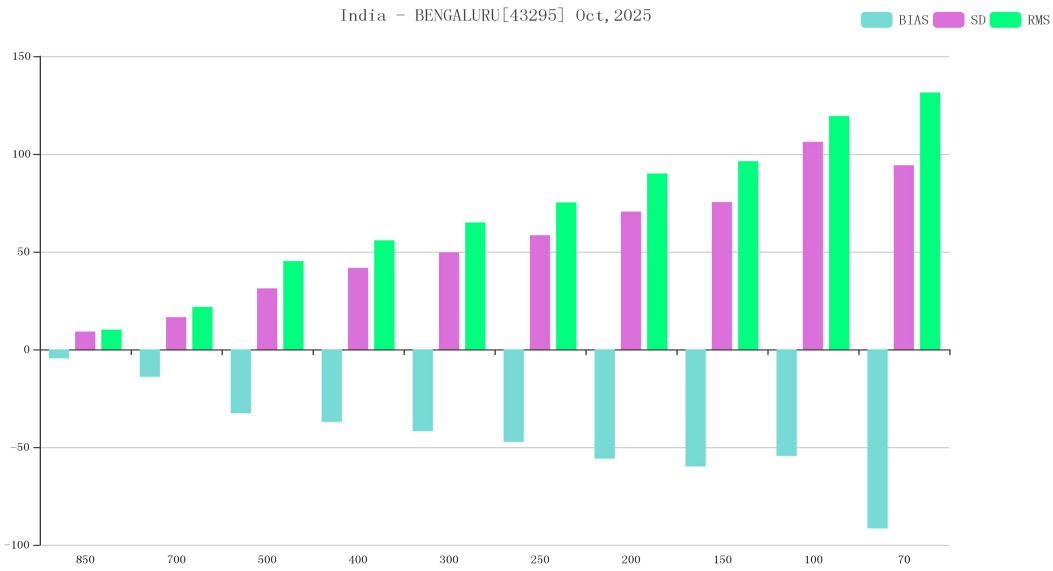

Figure 17 BIAS、SD and RMS of GPH for station 43295(OBS-TIME:00)

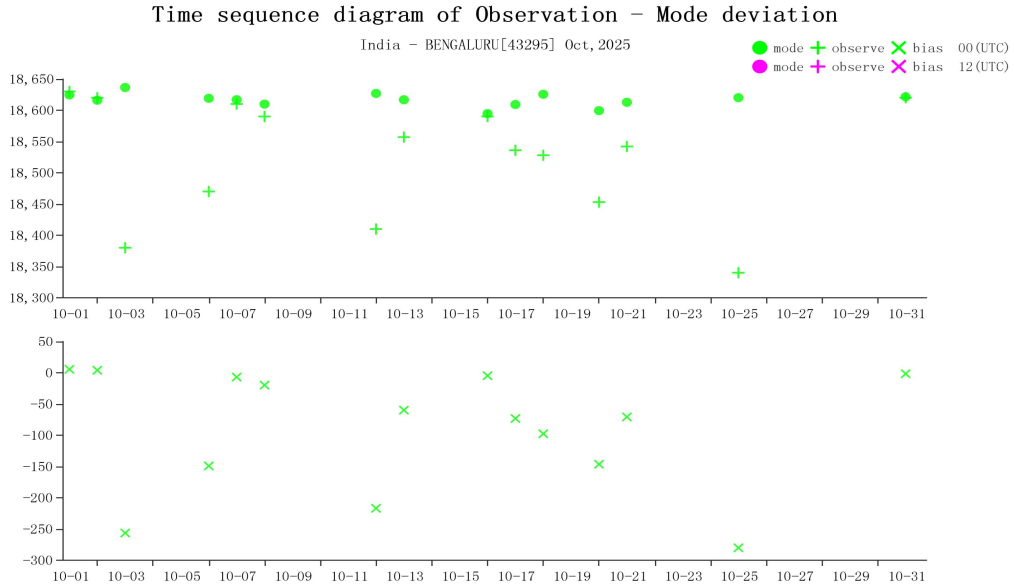

Figure 18 Time-series representation of GPH Obs minus first guess for station 43295(Level:70)

3.3 Vector Wind (WIN_S)

3.3.1 List of Suspect Stations

No suspect stations.

3.3.2 Station Analysis

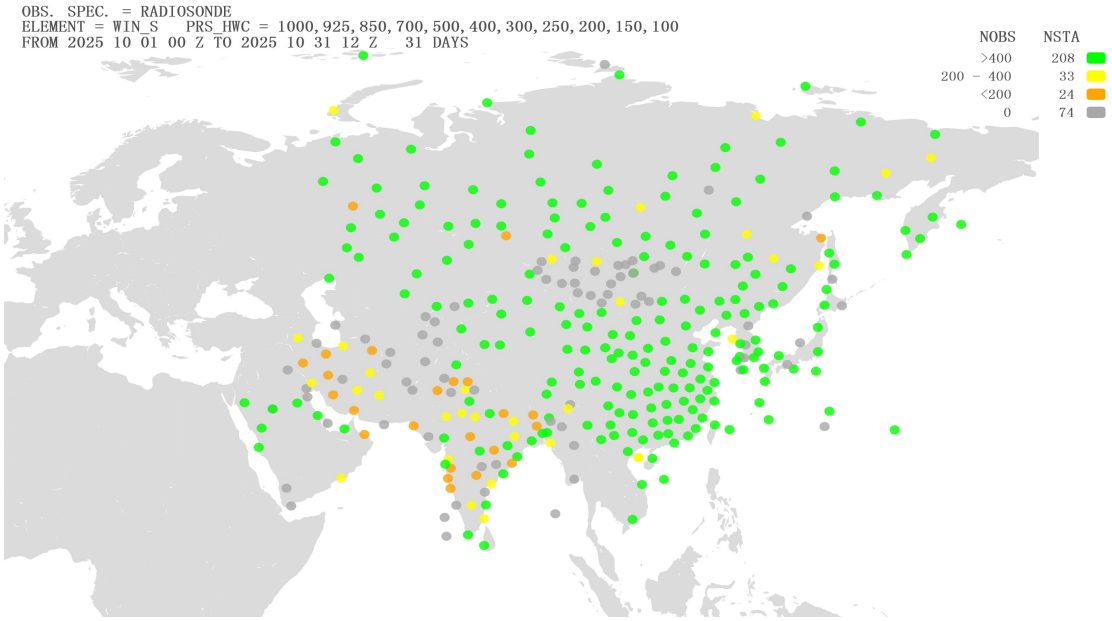

Figure 19 Location of all radiosonde stations reporting vector wind observations in Region II over the month of October 2025. NOBS shows the total number of observations received at RWC-Beijing, corresponding total number of stations (NSTA) and color scale are shown at the top of the figure, color green 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

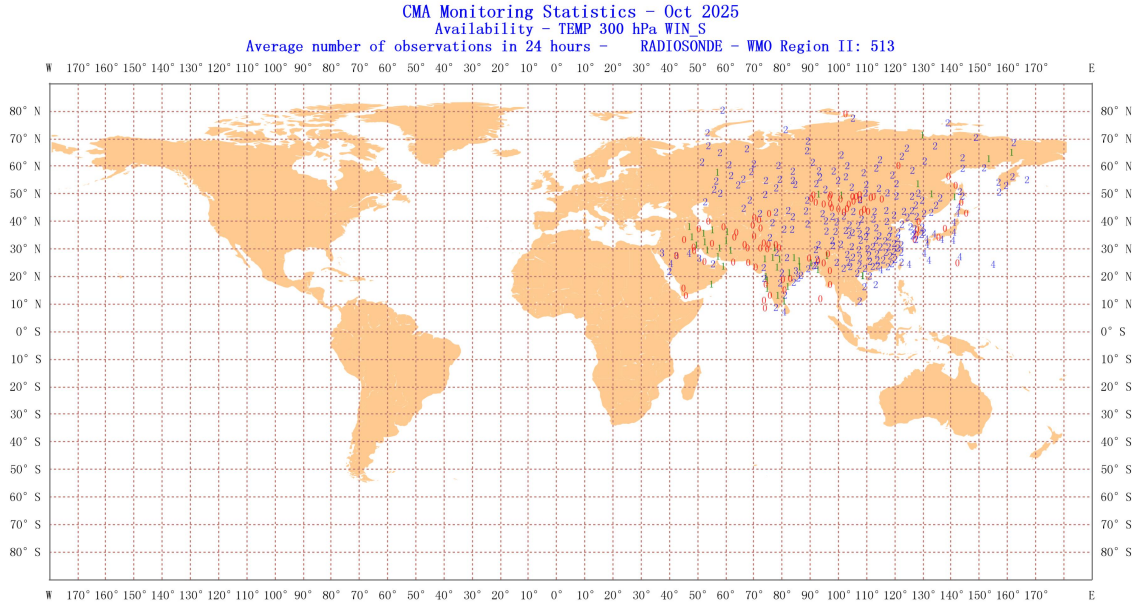

Figure 20 Location of all radiosonde stations reporting vector wind average number of observations in 24 hours in Region II over the month of October 2025

3.4 Wind Direction (WIN_D)

3.4.1 List of Suspect Stations

Table 3 List of WIN_D suspected in October 2025

INDEX	STATION_CODE	MEMBER	OBS TIME	NUM OBS	BIAS	SD	MAX SPREAD
1	43192	India	00	12	10.9	18.9	1.2

3.4.2 Suspect Station Analysis

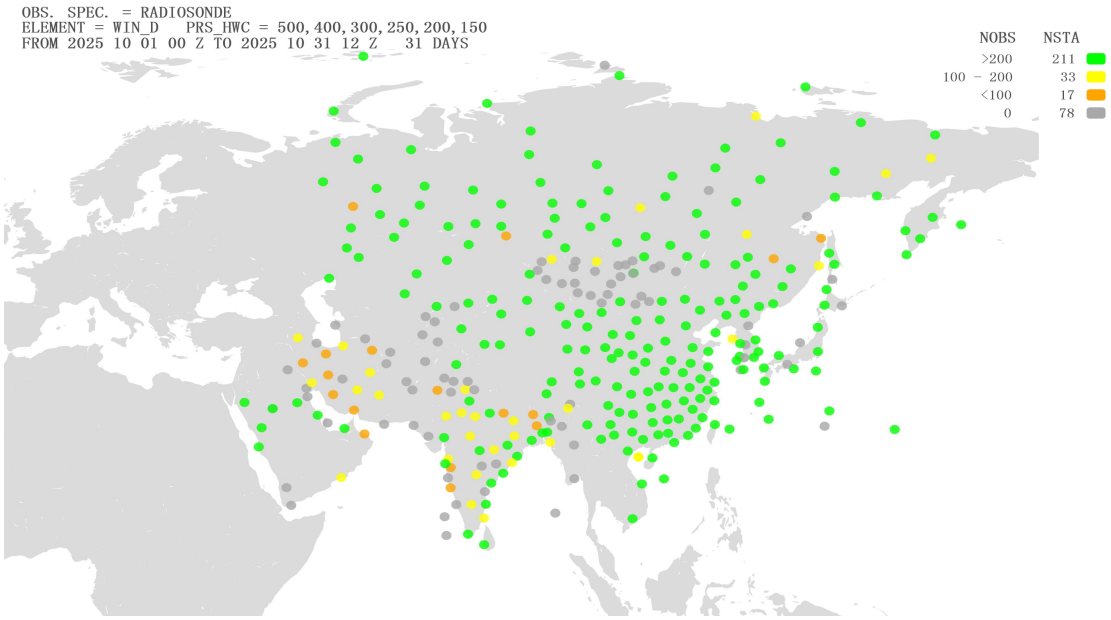

Figure 21 Location of all radiosonde stations reporting wind direction observations in Region II over the month of October 2025. NOBS shows the total number of observations received at RWC-Beijing, corresponding total number of stations (NSTA) and color scale are shown at the top of the figure, color 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

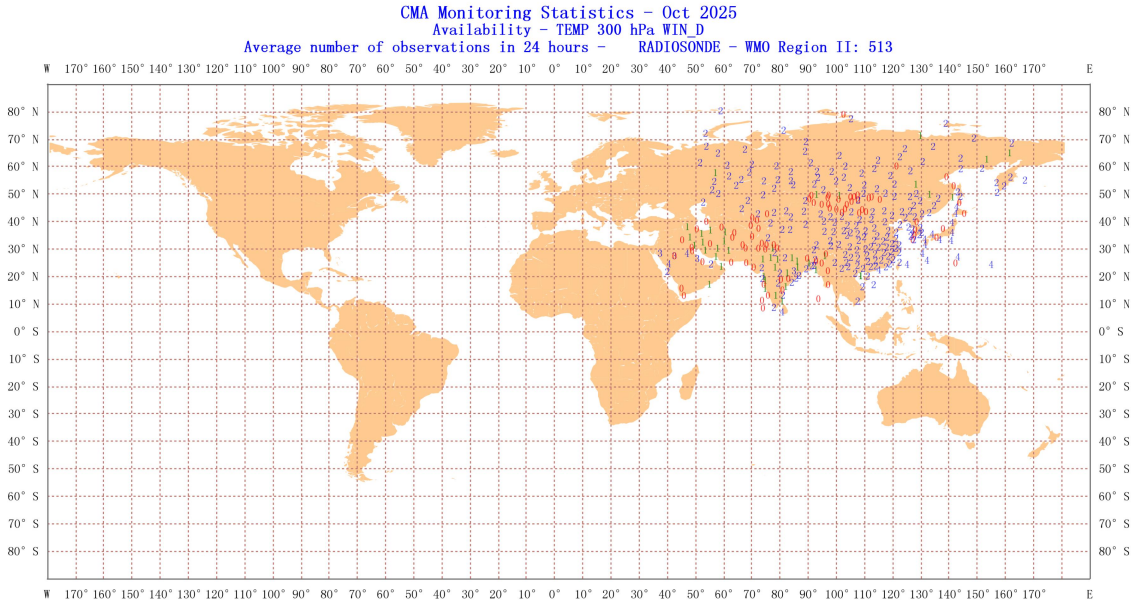

Figure 22 Location of all radiosonde stations reporting wind direction average number of observations in 24 hours in Region II over the month of October 2025

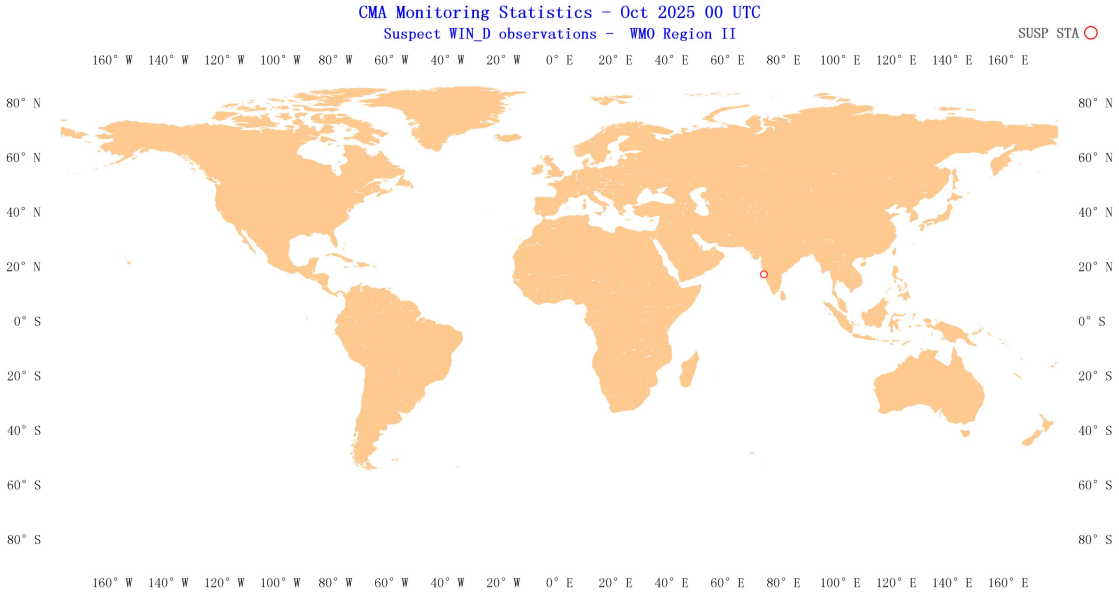

Figure 23 Distribution of suspect stations - Wind Direction 00 UTC

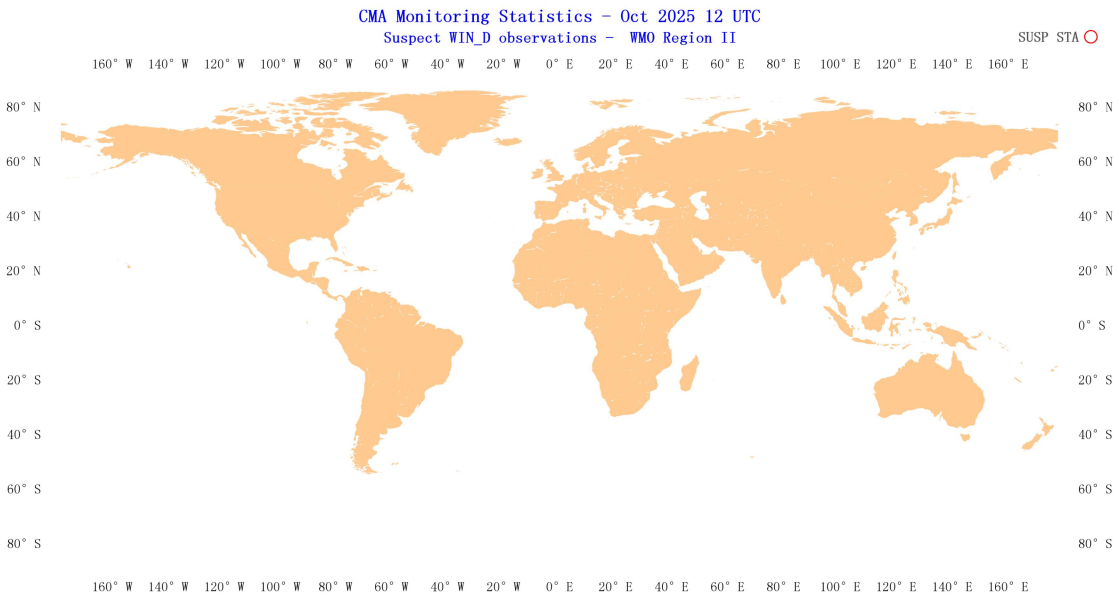

Figure 24 Distribution of suspect stations - Wind Direction 12 UTC

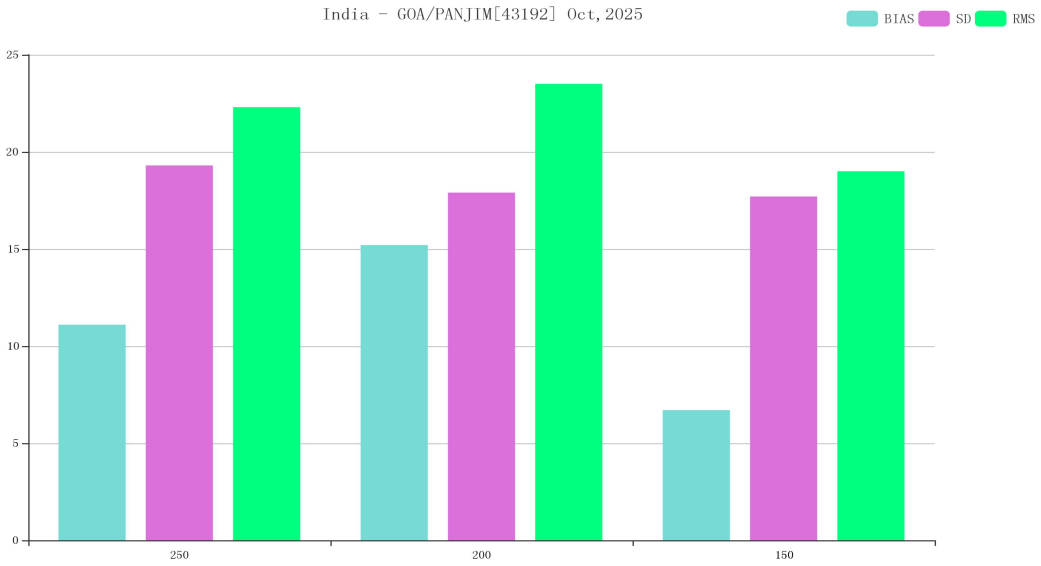

Figure 25 BIAS、SD and RMS of WIN_D for station 43192(OBS-TIME:00)

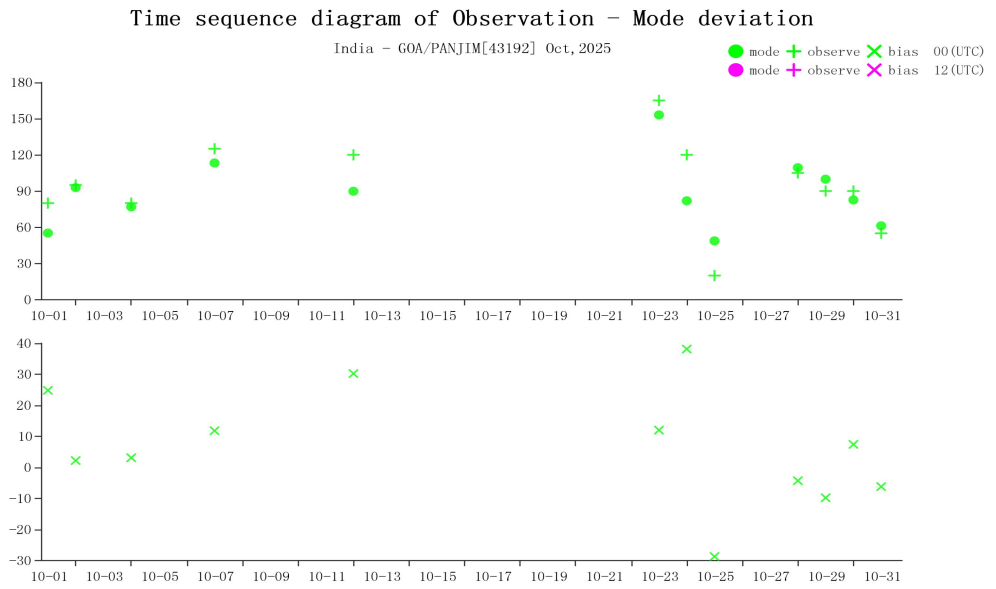

Figure 26 Time-series representation of WIN_D Obs minus first guess for station 43192(Level:150)

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	200				
					Russian Federation	23933	12	200				
	Russian Federation	25703	12	30	Russian Federation	25703	12	50				
	Russian Federation	25913	00	70	Russian Federation	25913	00	100	Russian Federation	25913	00	100
	Russian Federation	25913	12	70	Russian Federation	25913	12	100	Russian Federation	25913	12	100
	Russian Federation	31770	00	70	Russian Federation	31770	00	250	Russian Federation	31770	00	250
	Iran, Islamic Republic of	40811	12	30	Iran, Islamic Republic of	40811	12	150	Iran, Islamic Republic of	40811	12	150
	India	42348	00	925								
	India	43295	00	70					India	43295	00	150
Vector Wind					Russian Federation	36096	00	150	Russian Federation	36096	00	150
Wind Direction	India	43192	00	12								

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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