



**Ministry of Earth Sciences
India Meteorological Department
Cyclone Warning Division, New Delhi**

**Tropical Cyclone Forecast Programme
Report Dated 24th October, 2024**

Time of Issue: 1200 UTC

Synoptic features (based on 0900 UTC analysis):

Sub: Severe Cyclonic storm “DANA” over northwest Bay of Bengal (Cyclone Warning for Odisha and West Bengal coasts: **Red Message)**

❖ Yesterday’s cyclonic storm “DANA” (pronounced as Dana) over Eastcentral Bay of Bengal moved north-northwestwards, intensified into a severe cyclonic storm over central & adjoining northwest Bay of Bengal in the mid-night (2330 hours IST) of the same day, the 23rd October, 2024. Continuing to move further north-northwestwards, it lay centred at 0830 hrs IST of today, the 24th October, over northwest Bay of Bengal, near latitude 18.9° N and longitude 88.0°E, about 210 km southeast of Paradip (Odisha), 240 km south-southeast of Dhamara (Odisha) and 310 km south of Sagar Island (West Bengal).

It is very likely to move north-northwestwards and cross north Odisha and West Bengal coasts between Puri and Sagar Island close to Bhitarkanika and Dhamara (Odisha) during mid-night of 24th to morning of 25th October, 2024 as a severe Cyclonic Storm with a wind speed of 100-110 kmph gusting 120 kmph.

❖ The upper air cyclonic circulation over Comorin area now lies over Southeast Arabian Sea & adjoining Lakshadweep area and extends upto 4.5 km above mean sea level.

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) °C	30°C over central & north BoB	<ul style="list-style-type: none"> ➤ 28-30°C over eastern parts of AS. ➤ 27°C over the westcentral and southwest parts of AS
Tropical Cyclone Heat Potential (TCHP) kJ/cm²	<ul style="list-style-type: none"> ➤ 100 over westcentral BoB, ➤ Around 70-80 over northwest BoB 	<ul style="list-style-type: none"> ➤ 80-90 over central parts of south AS and adjoining EIO. ➤ 60-70 over eastcentral AS ➤ < 50 over westcentral AS & off Oman and Somalia coasts
Cyclonic Relative vorticity (X10⁻⁶s⁻¹)	300 around system centre over northwest BoB with vertical extension upto 500 hpa level	<ul style="list-style-type: none"> ➤ 30-40 over south AS ➤ 20-30 over westcentral AS off Somalia coast with vertical extension upto 500 hpa level
Low Level	20 to the southwest of system area	➤ 5-10 over eastcentral AS

convergence ($X10^{-5} s^{-1}$)		➤ another 5-10 over Somalia coast
Upper Level divergence ($X10^{-5} s^{-1}$)	20 to the southwest of system area	5-10 over southeast AS and Comorin areas
Vertical Wind Shear (VWS knots) Low: 05-10 knots Moderate: 10-20 knots High: >20 knots	moderate over northwest BoB	Low-moderate over central AS and high over north & south AS and adjoining EIO
Wind Shear Tendency (knots)	Decreasing around system area	Increasing tendency over eastcentral AS along west coast of India. Decreasing tendency over Rest of AS.
Upper tropospheric Ridge	along 20 .0°N over BoB	Along 18.0°N over AS.

Satellite observations based on INSAT imagery (0300 UTC):

(a) Over the BoB & Andaman Sea: -

Broken low/med clouds with embedded intense to very intense convection lay over north & central Bay of Bengal (Minimum cloud top temperature minus 80-93 deg Celsius). Scattered low/med clouds with embedded moderate to intense convection lay over south Bay of Bengal and Andaman sea.

(b) Over the Arabian Sea: -

Scattered low and medium clouds with embedded moderate to intense convection lay over south & adjoining central Arabian Sea, Lakshadweep Island Area and Comorin area.

(c) Convection outside India:

Scattered low and medium clouds with embedded moderate to intense convection lay over Sri Lanka, Palk Str, gulf of Mannar, Maldives, Tibet, China, East China Sea, Myanmar, Thailand, Gulf of Thailand, gulf of Tonkin, Hainan, Taiwan, Sumatra, Strait of Malacca, Malaysia, Borneo, South China Sea, Java Islands & Sea, Philippines, Sulu Sea, South Mozambique channel and over Indian Ocean between latitude 5.0° N to 25.0° S and longitude 60.0° E to 100.0° E.

M.J.O. Index:

Madden Julian Oscillation (MJO) index is currently in Phase 5 with amplitude greater than 1. It is likely to continue in same phase during next 5 days with amplitude remaining more than 1.

Storms and Depression over South China Sea/ South Indian Ocean:

Nil

Input for FDP Cyclone based on 0000 UTC for the next 7 days

MODEL GUIDANCE	Bay of Bengal (BoB)	Arabian Sea (AS)
IMD-GFS	IMD GFS is indicating VSCS over Northwest BoB (20.5/87.5) on 24/00 UTC and crossing Odisha coast (20.8/87.1) around 25/00 UTC. Model is indicating	Cyclonic circulation over southeast Arabian Sea as on

	southwestwards of its remnant.	today having westward movement till 28 th .
IMD-GEFS	IMD GEFS indicating Very Severe Cyclonic Storm (VSCS) over northwest BoB (19/89) on 24/00 UTC, crossing on 25/00 UTC near (20/86.4). Model is indicating southwestwards movement thereafter.	Cyclonic circulation over southeast Arabian Sea as on today having westward movement till 26 th .
IMD-WRF	Very Severe Cyclonic Storm over northwest BoB (18.0/87.5) on 24/00 UTC, crossing over Odisha coast (Baleshwar) near (20.5/86.5) on 26/00 UTC.	Cyclonic circulation over southeast Arabian Sea as on today having westward movement.
NCMRWF-NCUM(G)	VSCS over northwest BoB near (19/88) on 24/00 UTC and crossing West Bengal coast (21/88) on 25/00 UTC. It is also indicating southwestwards movement towards Eastcentral Arabian Sea.	Extended cyclonic circulation over southeast Arabian Sea and adjoining Lakshaadweep area as on today having westward movement till 26 th .
NCMRWF-NCUM(R)	NCUM(R) is indicating VSCS over northwest BoB (19/87) on 24/00 UTC, crossing over Odisha coast near Puri (19.5/86) on 25/00 UTC and moving southwestwards thereafter.	Extended cyclonic circulation over southeast Arabian Sea and adjoining Lakshaadweep area as on today having westward movement till 26 th .
NCMRWF-NEPS	SCS over northwest BoB (19/88.5) on 24/00 UTC, Crossing near (20.5/88) on 25/00 UTC. Model is indicating southwestwards of its remnant towards Eastcentral Arabian Sea.	Extended cyclonic circulation over southeast Arabian Sea and adjoining Lakshaadweep area as on today having westward movement till 26 th .
ECMWF	ECMWF is indicating SCS over northwest BoB (19.0/87.8) on 24/00 UTC, crossing near Odisha Coast (20.7/86.7) as CS on 24/18 UTC. Model is indicating southwestwards of its remnant.	Extended cyclonic circulation over southeast Arabian Sea and adjoining Lakshaadweep area as on today having westward movement till 27 th without further intensification.

NCEP-GFS	NCEP GFS VSCS over northwest BoB (19.5/87.9) on 24/00 UTC, Crossing over West Bengal coast near Baleswar (21.2/86.7) on 25/00 UTC as a SCS.	Extended cyclonic circulation over southeast Arabian Sea and adjoining Lakshaadweep area as on today having westward movement till 26 th without further intensification.
IMD MME	IMD MME is indicating SCS over northwest BoB (18.7/87.7) on 24/00 UTC and crossing Odisha Coast (20.6/86.5) around 25/00 UTC as an SCS.	-

Summary:

(a) Bay of Bengal:

There is now convergence among various models wrt initial conditions and crossing over Odisha coast. However, NCEP GFS & NCUM (G) is still indicating crossing over West Bengal coast. Regarding landfall time there is consensus among models between 24/21 UTC to 25/00 UTC. IMD MME is indicating landfall time around 25/00 UTC. And intensity at the time of landfall is varying from cyclonic storm category (40 kt) to very severe cyclonic storm (70-80 kt).

(b) Arabian Sea

Most of the models are indicating an extended cyclonic circulation over southeast Arabian Sea and adjoining Lakshadweep area as on today, having its westward movement without further intensification.

Inference:

Considering various environmental conditions and model guidance, it is inferred that:

- ❖ Severe cyclonic storm 'Dana' is very likely to move north-northwestwards and cross north Odisha and West Bengal coasts between Puri and Sagar Island close to Bhitarkanika and Dhamara (Odisha) during mid-night of 24th to morning of 25th October, 2024 as a severe Cyclonic Storm with a wind speed of 100-110 kmph gusting 120 kmph.
- ❖ No fresh cyclogenesis is likely over Bay of Bengal & Arabian Sea for the next seven days.

Probability of cyclogenesis (formation of depression and above intensity systems) over the Bay of Bengal during next 168 hours:

24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
-	NIL	NIL	NIL	NIL	NIL	NIL

“-“ indicate genesis has already occurred.

Probability is indicated as NIL for 0%, LOW for 1-33%, MOD for 34-67% and High for 68-100%.

Probability of cyclogenesis (formation of depression and above intensity systems) over the Arabian Sea during next 168 hours:

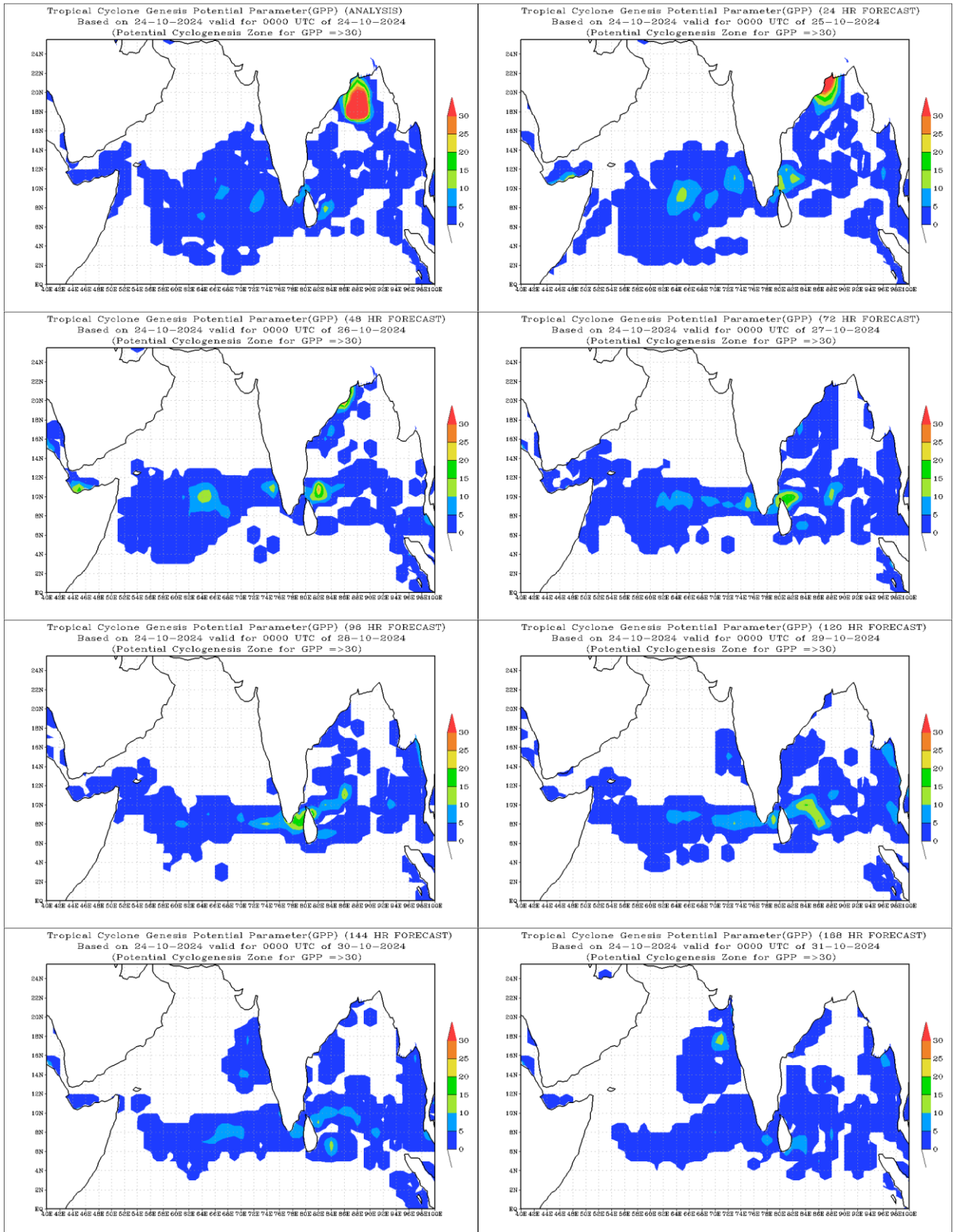
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	NIL	NIL	NIL

“-“ indicate genesis has already occurred.

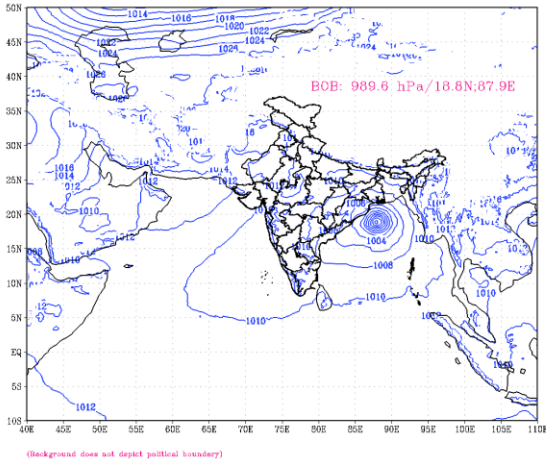
Probability is indicated as NIL for 0%, LOW for 1-33%, MOD for 34-67% and High for 68-100%.

Intense Observation Period (IOP) is suggested for:

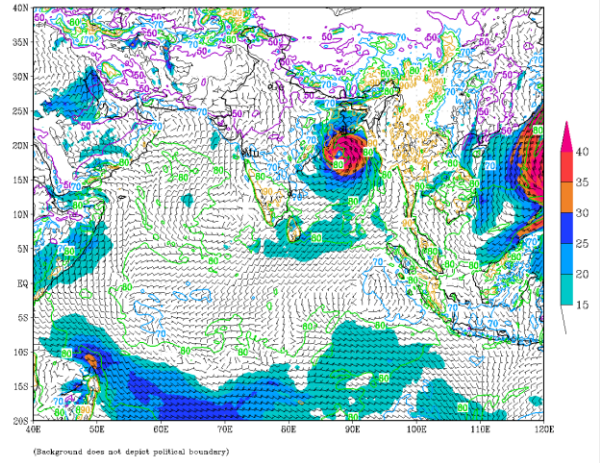
Odisha, West Bengal coasts during 24th – 25th October.



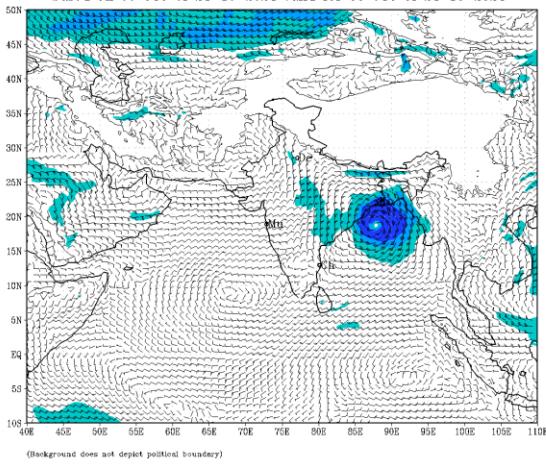
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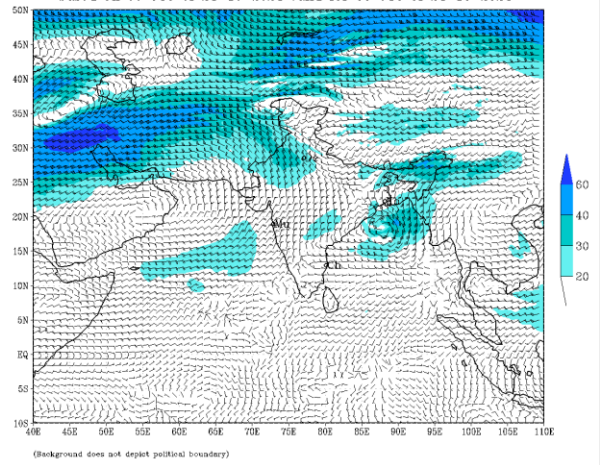
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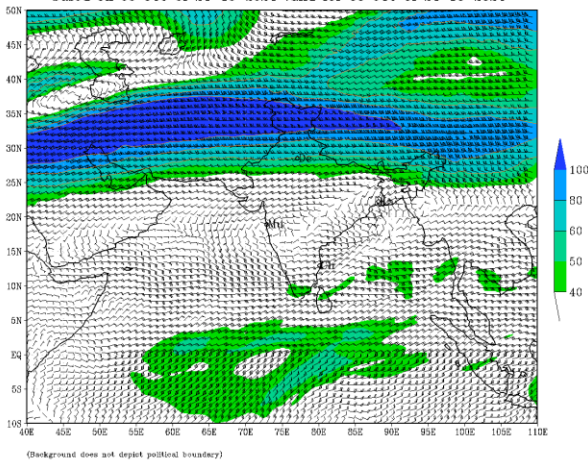
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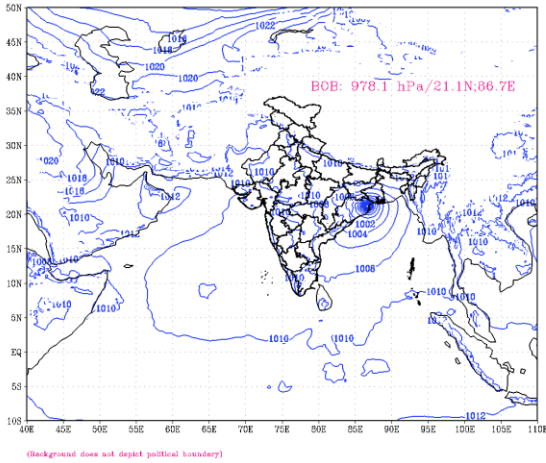
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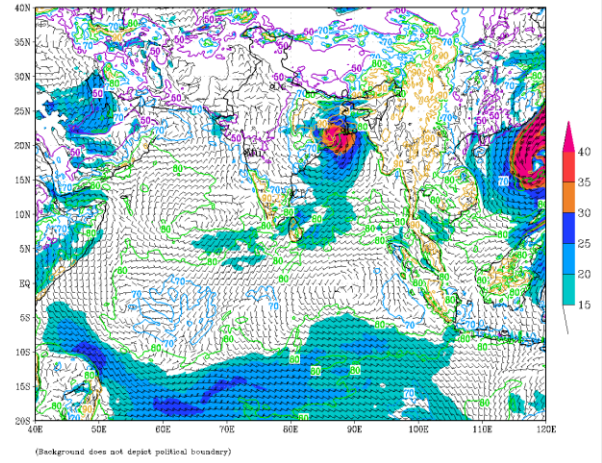
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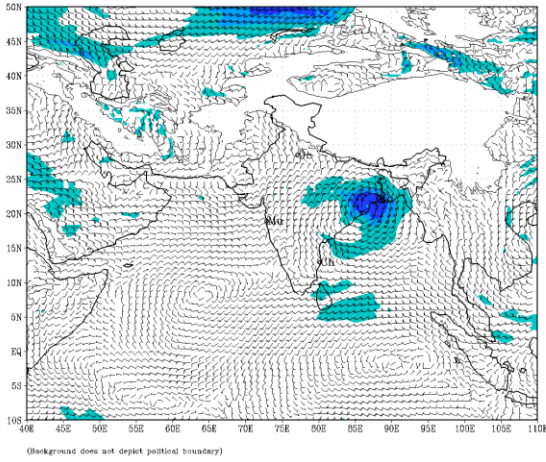
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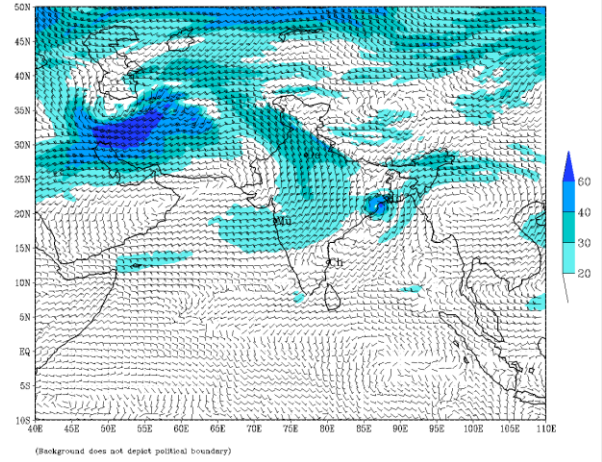
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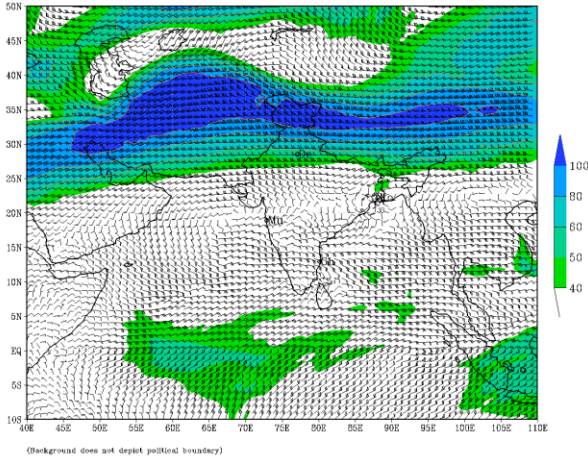
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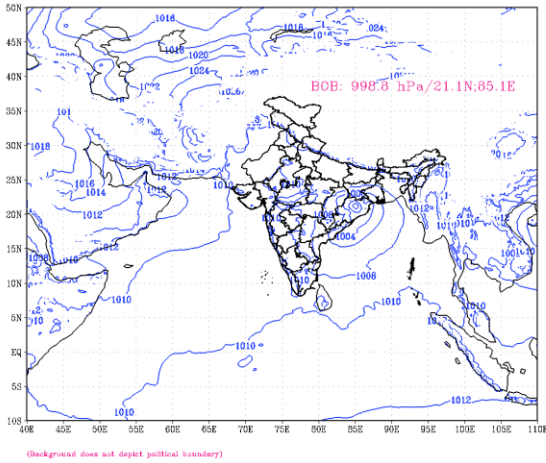
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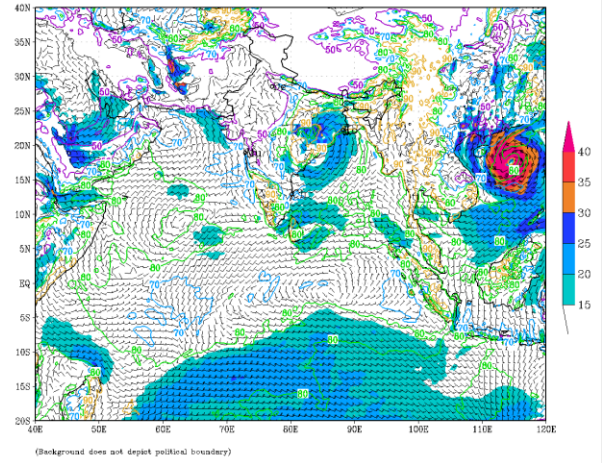
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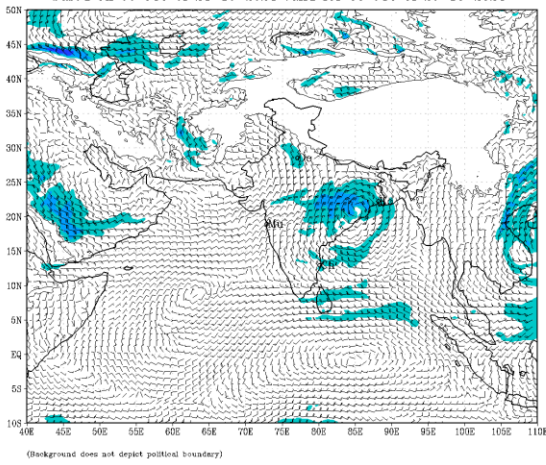
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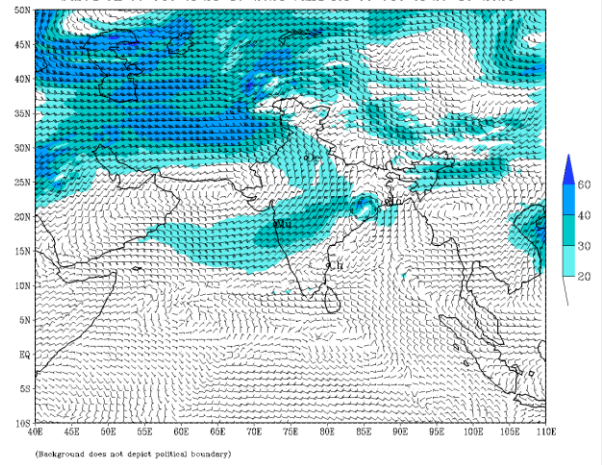
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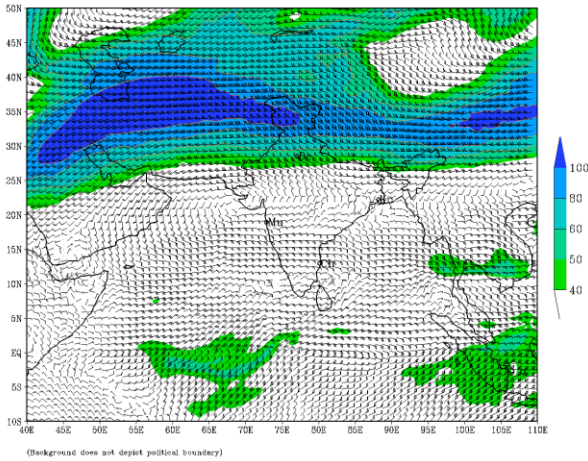
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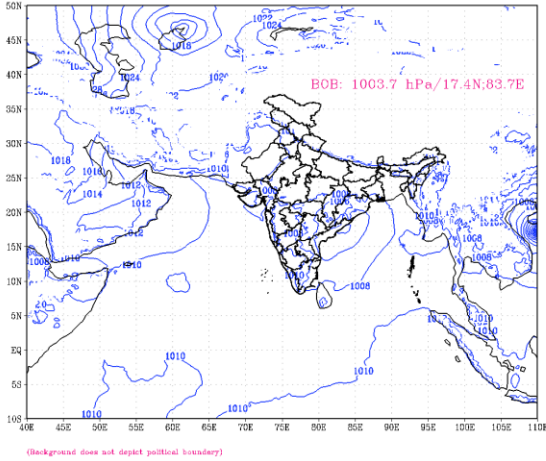
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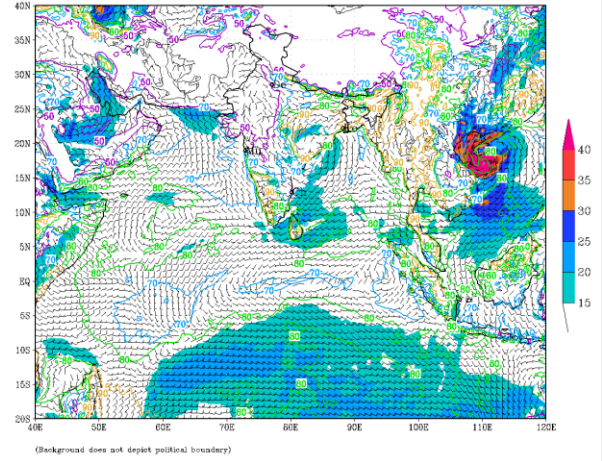
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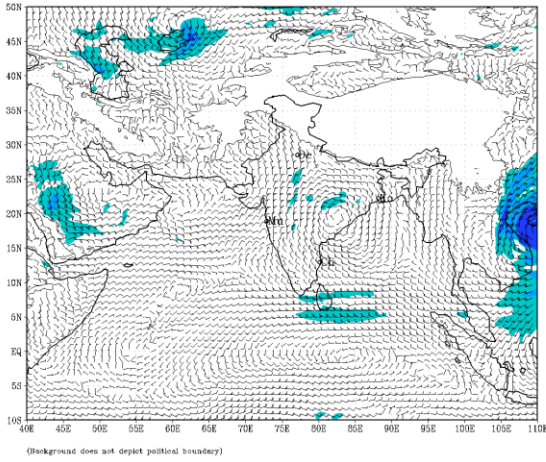
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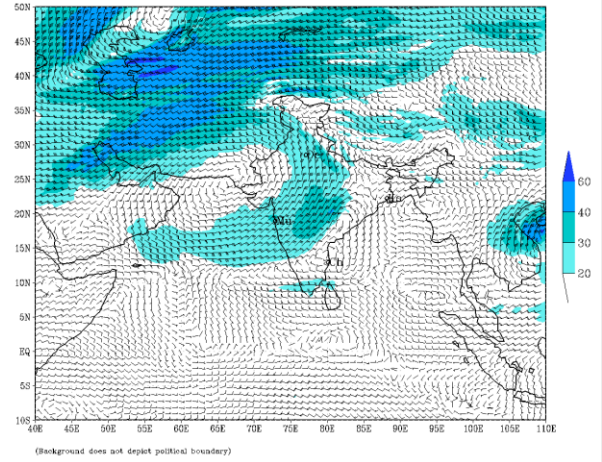
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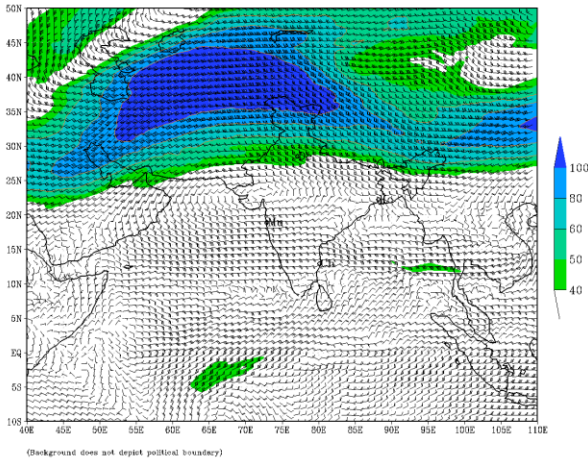
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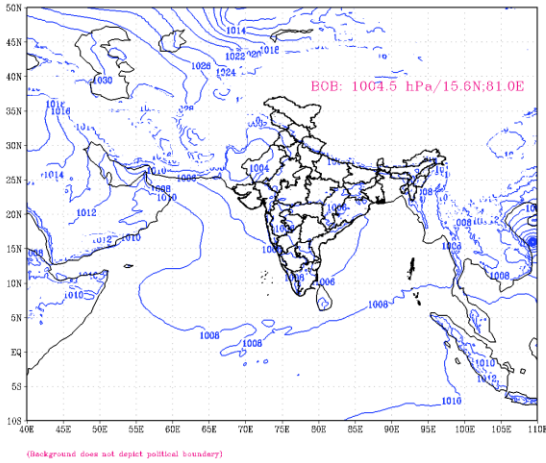
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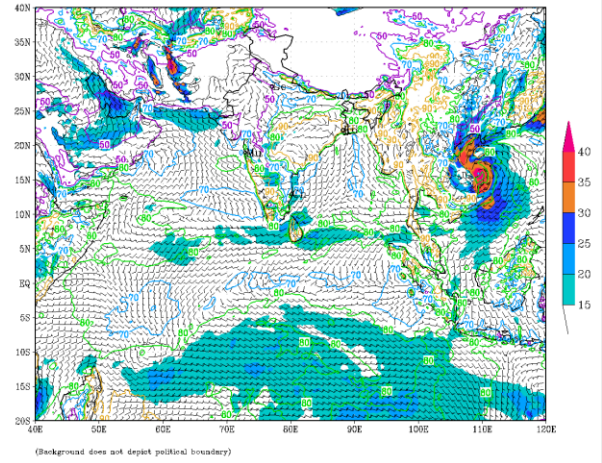
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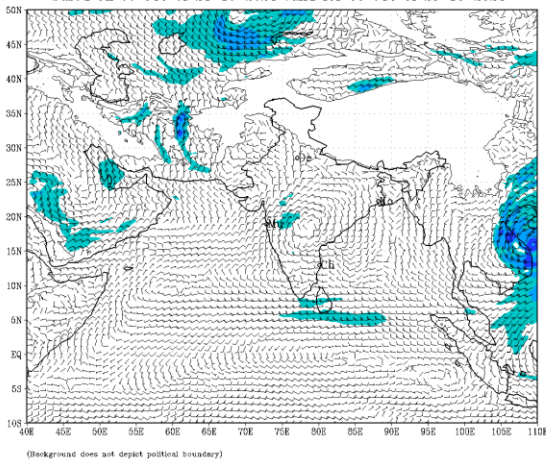
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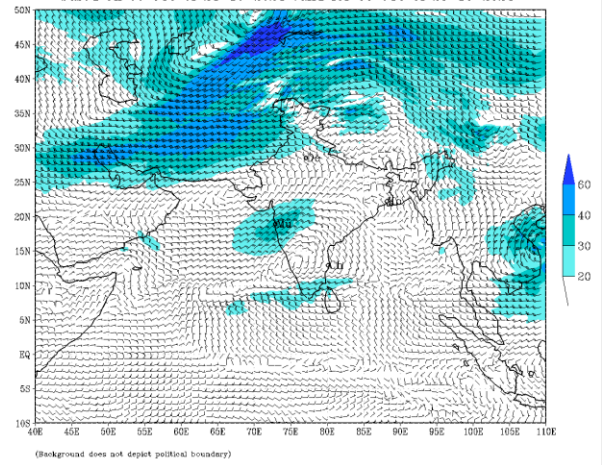
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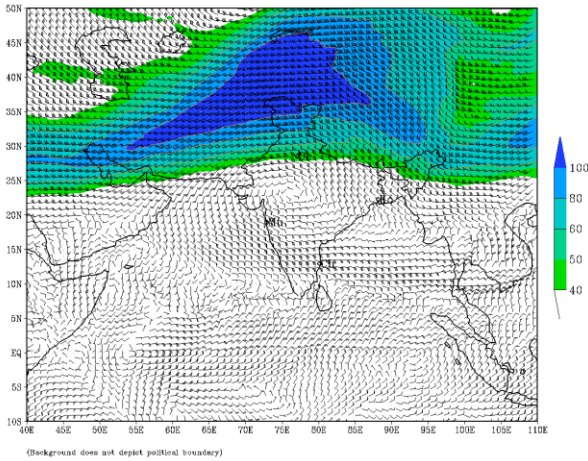
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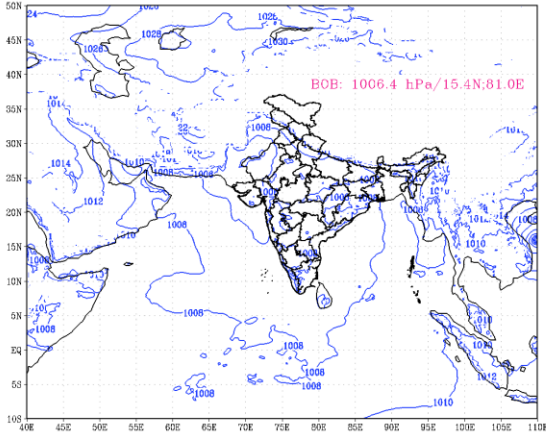
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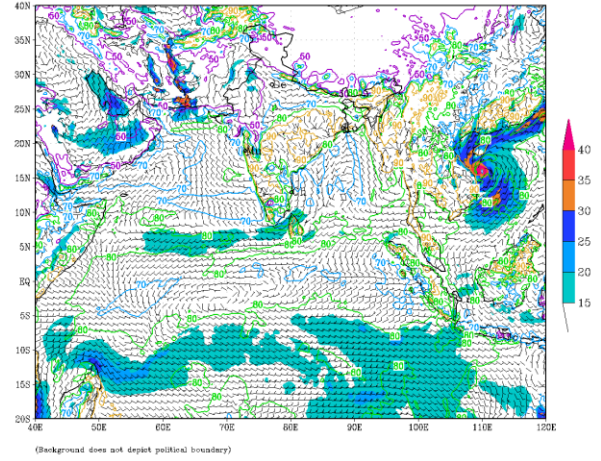
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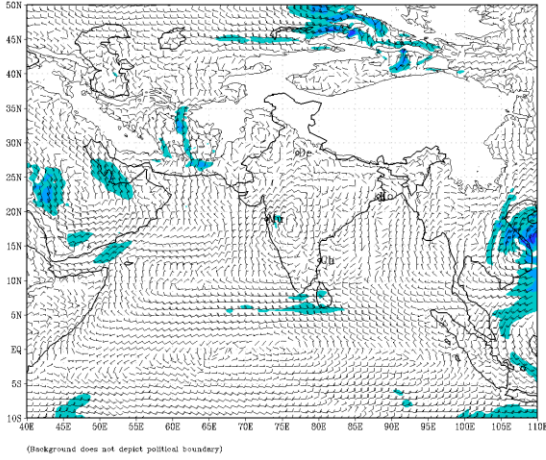
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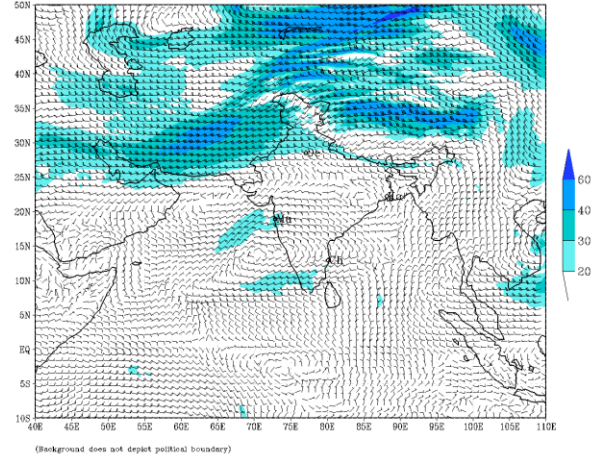
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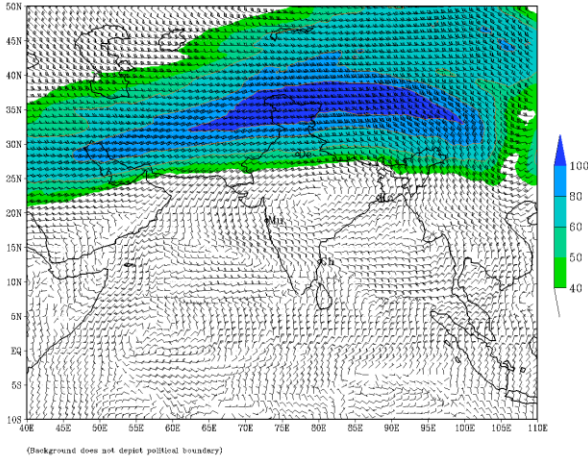
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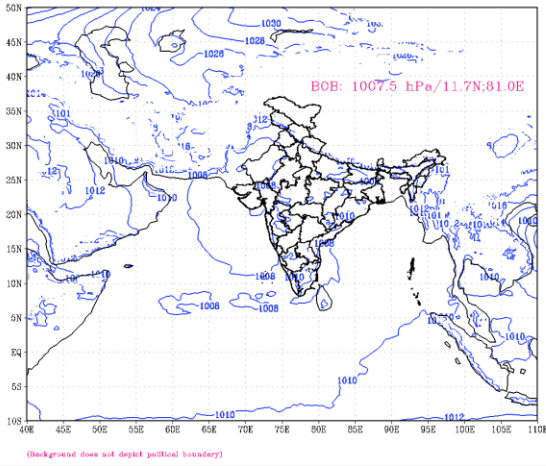
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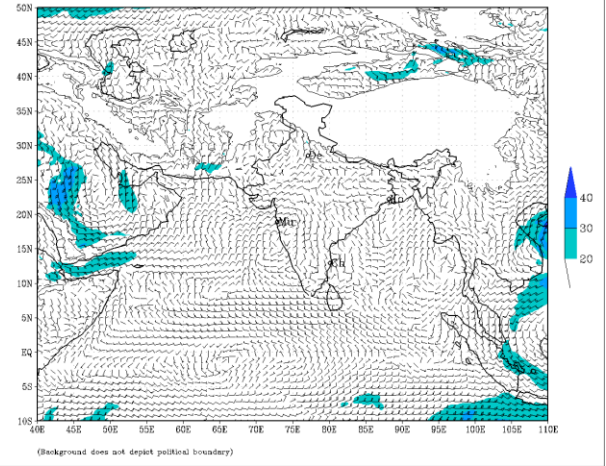
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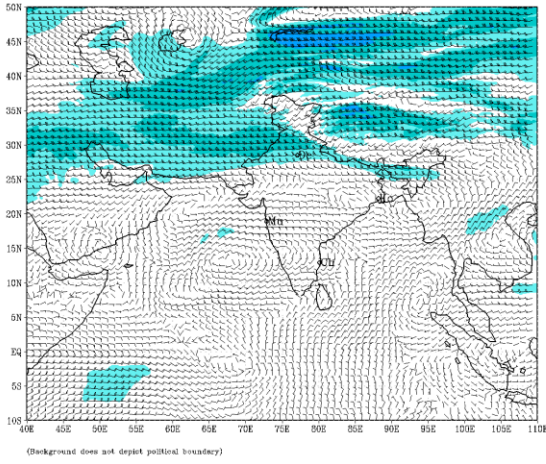
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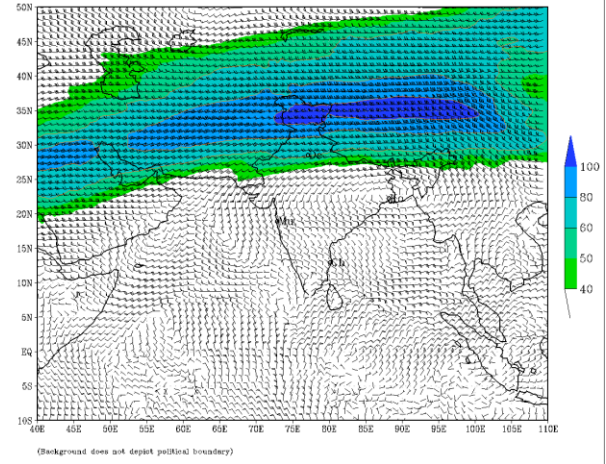
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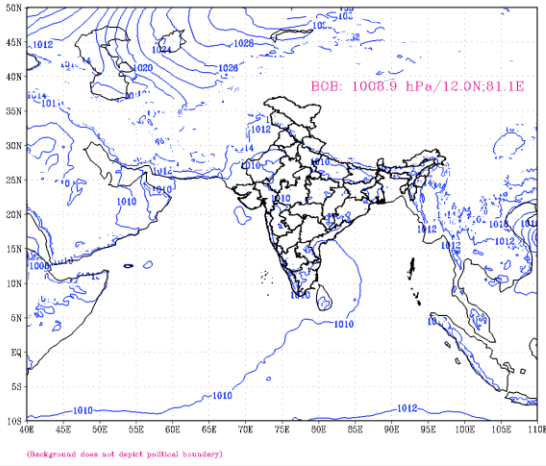
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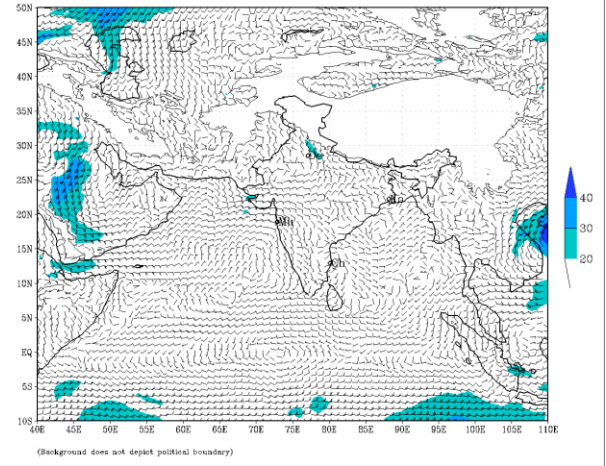
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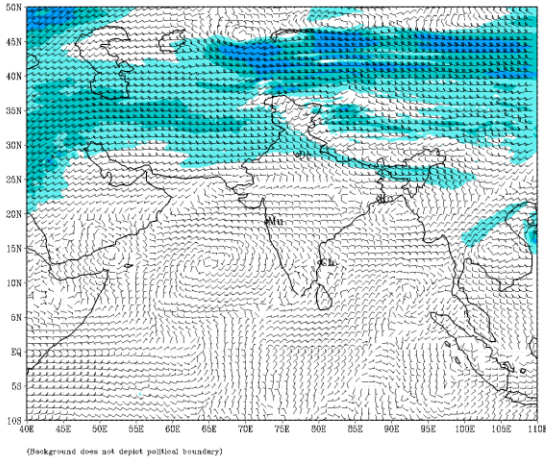
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IMD :GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)
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IMD :GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 24-10-2024 valid for 00 UTC of 31-10-2024



IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 24-10-2024 valid for 00 UTC of 31-10-2024

