



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

**Tropical Cyclone Forecast Programme
Report Dated 23rd October, 2024**

Time of Issue: 1400 UTC

Synoptic features (based on 0900 UTC analysis):

Sub: Cyclonic storm “DANA” over eastcentral Bay of Bengal (Cyclone Warning for Odisha and West Bengal coasts: Orange Message)

Yesterday’s depression over eastcentral Bay of Bengal moved northwestwards, intensified into a deep depression in the same evening and into a cyclonic storm “DANA” over eastcentral Bay of Bengal in the early morning (0530 hours IST) of today, the 23rd October. It lay centred at 0830 hrs IST of today, the 23rd October, near latitude 16.5° N and longitude 89.6°E, about 520 km southeast of Paradip (Odisha), 600 km south-southeast of Sagar Island (West Bengal) and 610 km south of Khepupara (Bangladesh).

It is very likely to move northwestwards and intensify into a severe cyclonic storm over northwest Bay of Bengal by early morning of 24th and cross north Odisha and West Bengal coasts between Puri and Sagar Island close to Bhitarkanika and Dhamara (Odisha) during 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.

- ❖ Yesterday’s low pressure area over westcentral Arabian Sea became less marked at 0530 hours IST of today, the 23rd October, 2024.
- ❖ Yesterday’s cyclonic circulation over Eastcentral Arabian Sea off Karnataka became less marked at 0830 hours IST of today, the 23rd October, 2024

| 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 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) | 150 around system centre over eastcentral BoB with vertical extension upto 500 hpa level | 20-30 over westcentral AS off Somalia coast with vertical extension upto 500 hpa level |
| Low Level convergence (X10⁻⁵ s⁻¹) | 30 to the northwest of system area | <ul style="list-style-type: none"> ➤ 5-10 over eastcentral AS ➤ another 5-10 over Somalia |

| | | |
|--|--|---|
| | | coast |
| Upper Level divergence ($X10^{-5} s^{-1}$) | 20 to the northeast of system area | 5-10 over southeast AS |
| Vertical Wind Shear (VWS knots) Low: 05-10 knots Moderate: 10-20 knots High: >20 knots | moderate over central BoB | Low-moderate over central AS and high over north & south AS and adjoining EIO |
| Wind Shear Tendency (knots) | Decreasing tendency to the northwest of system centre. Increasing tendency over rest of BoB | Increasing tendency over eastcentral AS = Decreasing tendency over Rest of AS. |
| Upper tropospheric Ridge | along 15 .0°N over BoB | Along 17.0°N over AS. |

Satellite observations based on INSAT imagery (0300 UTC):

(a) Over the BoB & Andaman Sea: -

scattered to 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, Andaman sea, Arakan coast & Tenasserim coast

(b) Over the Arabian Sea: -

Scattered low and medium clouds with embedded moderate to intense convection lay over south Arabian Sea, Lakshadweep Island Area, Maldives 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, Tibet, China, Yellow Sea, East China Sea, Myanmar, Thailand, Gulf of Thailand, Cambodia, Laos, Vietnam, Sumatra, Strait of Malacca, Malaysia, Borneo, South China Sea, Java Islands & Sea, Celebes Islands & Sea, Philippines, Sulu Sea, Madagascar, and over Indian Ocean between latitude 5.0⁰ S to 20.0⁰ S and longitude 53.0⁰ E to 110.0⁰ 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 Severe Cyclonic Storm (SCS) over Eastcentral BoB (16.3/89.2) on 23/06 UTC, VSCS over Northwest BoB (19.5/88.0) on 24/06 UTC and crossing near north Puri (20.5/86.8) around 25/00 UTC. Model is | Cyclonic circulation over Eastcentral AS on 01 st Nov. |

| | | |
|-----------------------|--|--|
| | indicating southwestwards of its remnant towards Eastcentral AS till 01 st Nov. | |
| 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 till 30 th Oct and emergence of its remnant into Eastcentral AS on 01 st Nov. | Cyclonic circulation over Eastcentral AS on 31 st Oct. |
| IMD-WRF | WRF is indicating CS over Eastcentral BoB (15.5/90.5) on 23/00 UTC, Very Severe Cyclonic Storm over Westcentral BoB (17.5/88) on 24/00 UTC, crossing over West Bengal coast (Baleshwar) near (21/87.5) on 26/00 UTC. | No Significant System during next 3 days |
| NCMRWF-NCUM(G) | NCUM(G) is indicating CS over Eastcentral BoB (16.2/90) on 23/00 UTC, VSCS over northwest BoB near (18.5/88) on 24/00 UTC and crossing West Bengal coast (20.5/88) on 25/00 UTC. It is also indicating southwestwards movement towards Eastcentral AS till 30 th Oct and emerging into eastcentral BoB on 31 st Oct. | Cyclonic circulation over Eastcentral AS off Maharashtra coast on 31 st Oct and becoming less marked on 02 nd Nov. |
| NCMRWF-NCUM(R) | NCUM(R) is indicating CS over Eastcentral BoB (16.8/89.8) on 23/00 UTC, VSCS over westcentral BoB (17.5/87) on 24/00 UTC, crossing over Odisha coast near (19.8/85) on 25/00 UTC and moving southwestwards thereafter. | No Significant System during next 3 days |
| NCMRWF-NEPS | Cyclonic Storm over Eastcentral BoB (16/90) on 23/00 UTC, SCS over northwest BoB (18/88.8) on 24/00 UTC, Crossing near (20.2/87.8) on 25/00 UTC. Model is indicating southwestwards of its remnant towards Eastcentral AS till 28 th Oct and less marked thereafter. | No Significant System |
| ECMWF | ECMWF is indicating Cyclonic Storm (CS) over Eastcentral BoB (16.6/89.5) on 23/00 UTC, SCS over northwest BoB (19.1/87.7) on 24/00 UTC, crossing near Odisha Coast (20.5/86.2) as CS on 24/18 UTC. Model is indicating southwestwards of its remnant towards Eastcentral AS till 26 th Oct and less marked thereafter. | No Significant System |
| NCEP-GFS | NCEP GFS CS over Eastcentral BoB (16.6/89.4) on 23/00 UTC, SCS over northwest BoB (17.6/88.6) on 23/12 UTC, Crossing over Odisha coasts (21.4/87.0) on 25/00 UTC as a SCS. | No Significant System during next 10 days |
| IMD MME | IMD MME is indicating CS over Eastcentral BoB on 23/00 UTC and crossing Odisha Coast (20.86/86.92) around 25/01 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 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 25/01 UTC. And intensity at the time of landfall is varying from cyclonic storm category (40 kt) to very severe cyclonic storm (70-80 kt).

Considering all the above,

(b) Arabian Sea

No significant system during next 7 days.

Inference:

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

- ❖ The cyclonic storm “DANA” over eastcentral Bay of Bengal is very likely to move northwestwards, intensify into a Severe Cyclonic Storm over Northwest Bay of Bengal around 0300 UTC of 24th and cross north Odisha and West Bengal coasts between Puri and Sagar Islands during 1800 UTC of 24th and 0000 UTC to 25th October, 2024 as a Severe Cyclonic Storm with a wind speed of 100-110 kmph gusting 120 kmph.
- ❖ The existing low pressure area over westcentral Arabian Sea is likely to move westwards and become less marked by 23/00 UTC.

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 |

“-“ 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:

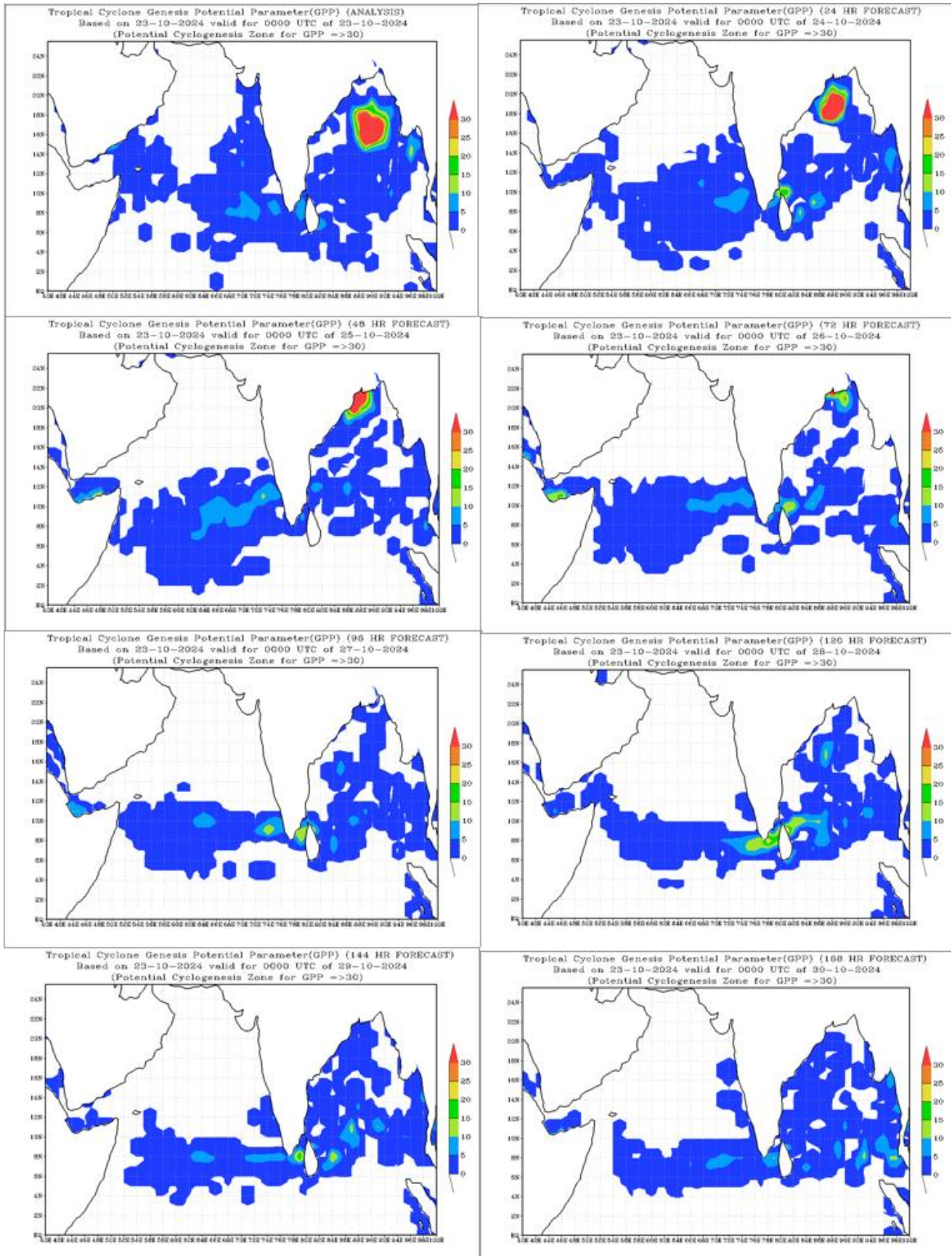
| 24 HOURS | 24-48 HOURS | 48-72 HOURS | 72-96 HOURS | 96-120 HOURS | 120-144 HOURS | 144-168 HOURS |
|----------|-------------|-------------|-------------|--------------|---------------|---------------|
| NIL | NIL | NIL | NIL | NIL | NIL | NIL |

“-“ indicate genesis has already occurred.

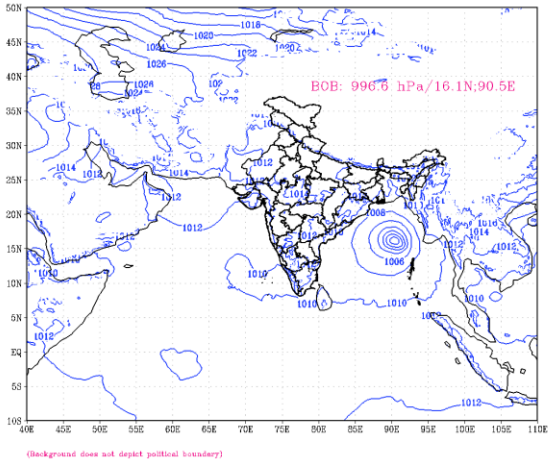
Probability is indicated as NIL for 0%, LOW for 1-33%, MOD for 34-67% and High for 68-100%.

Intense Observation Period (IOP) is suggested for:

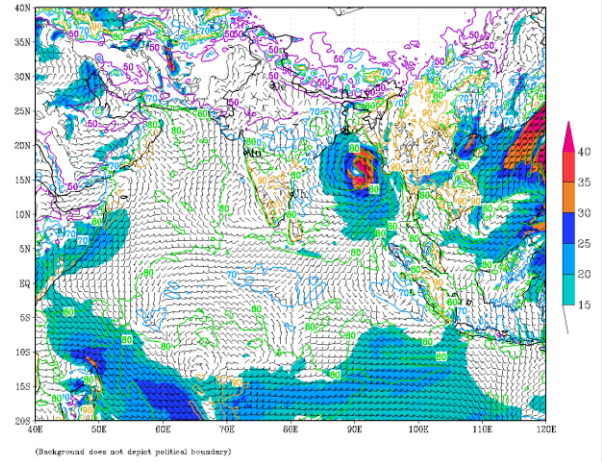
Odisha, West Bengal, Bangladesh and Myanmar coasts during 23rd – 25th October.



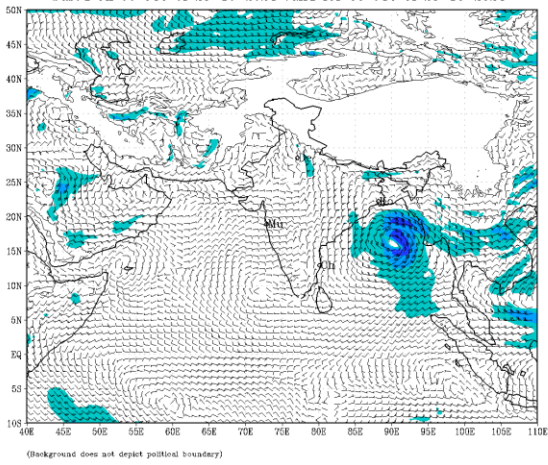
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based on 00 UTC of 23-10-2024 valid for 00 UTC of 23-10-2024



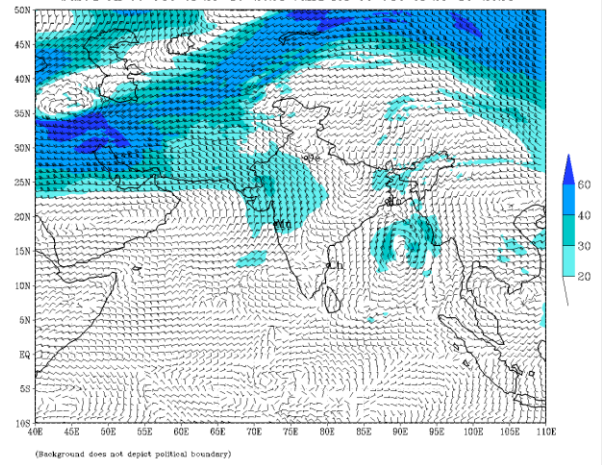
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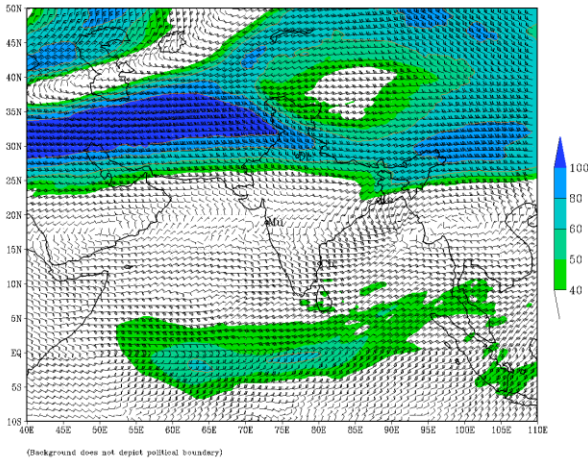
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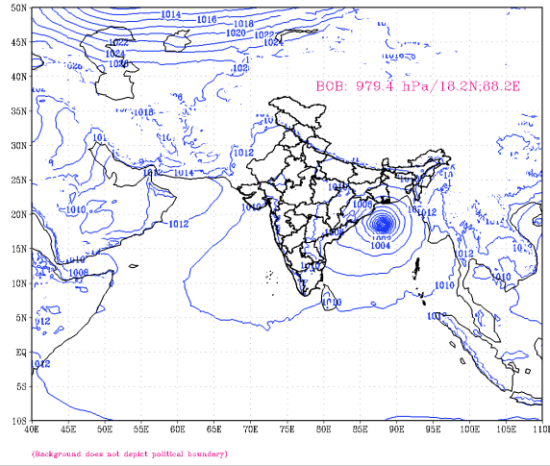
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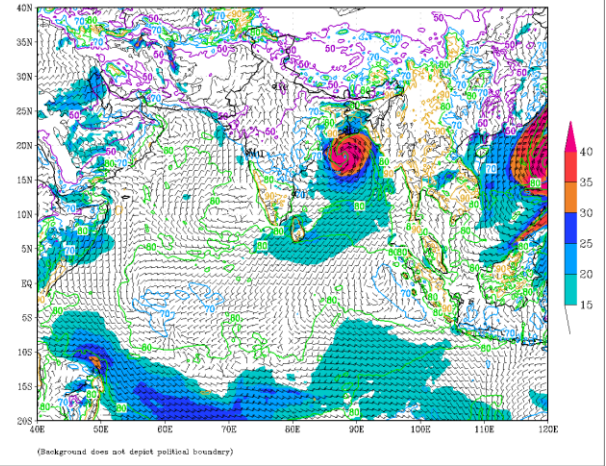
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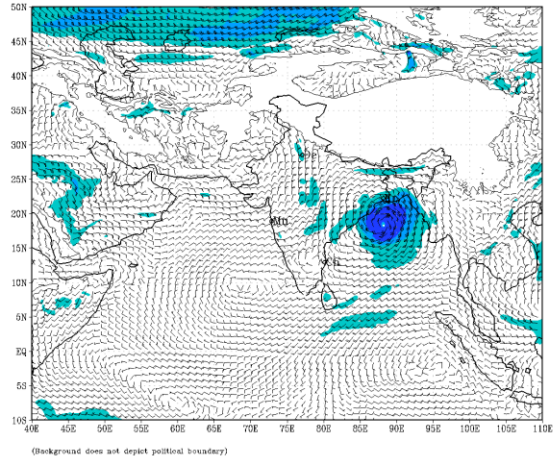
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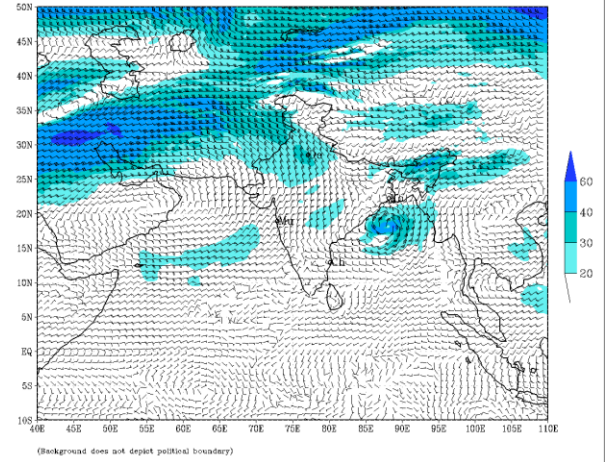
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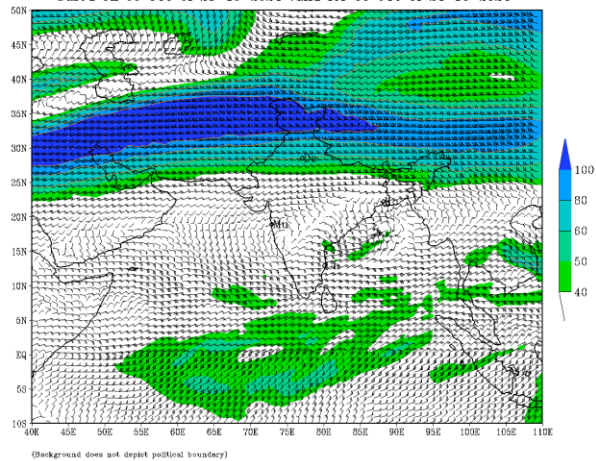
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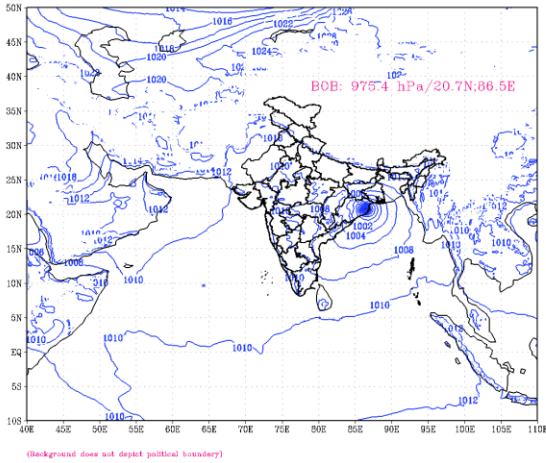
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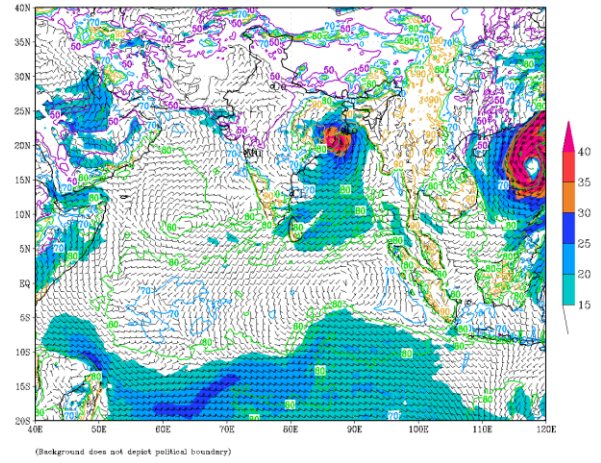
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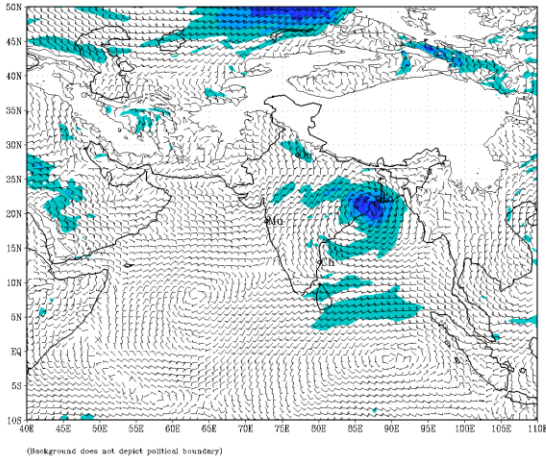
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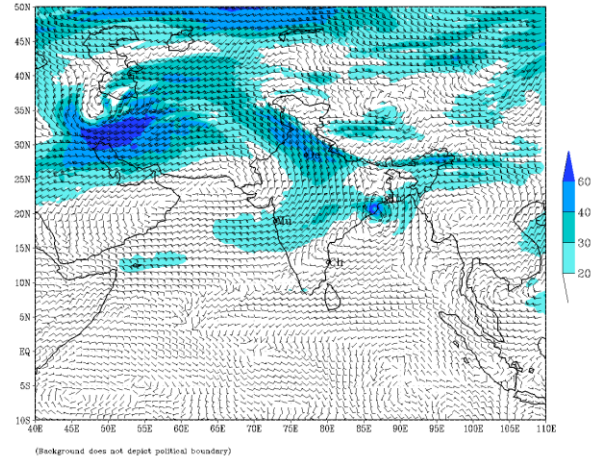
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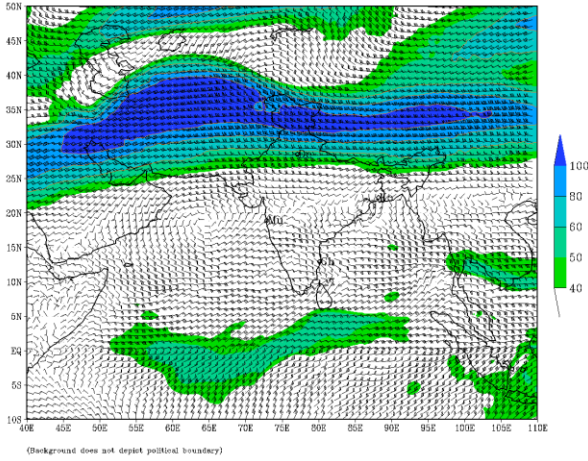
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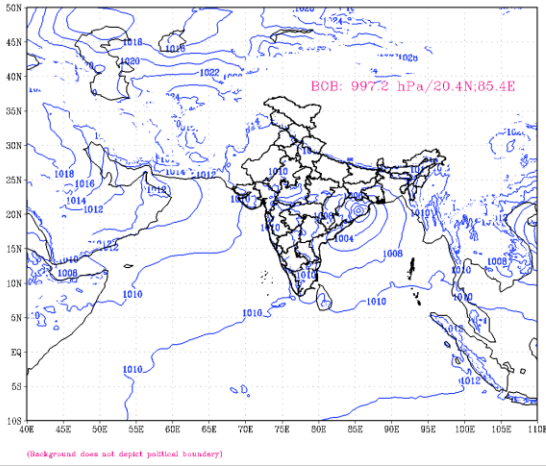
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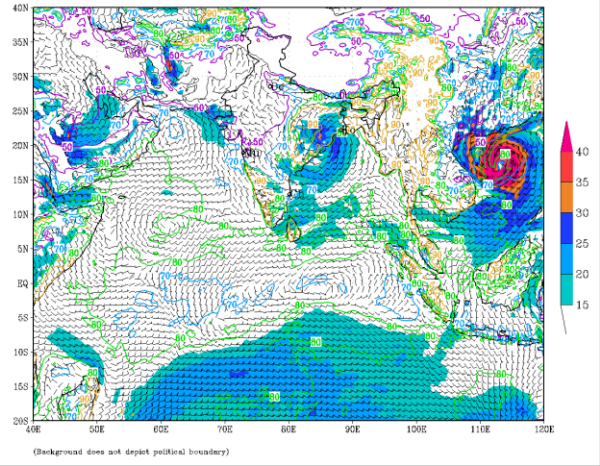
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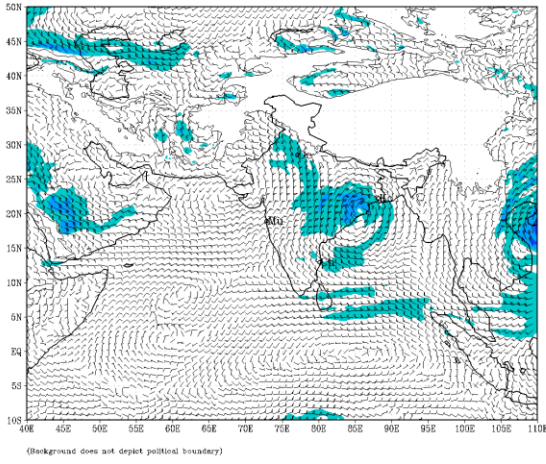
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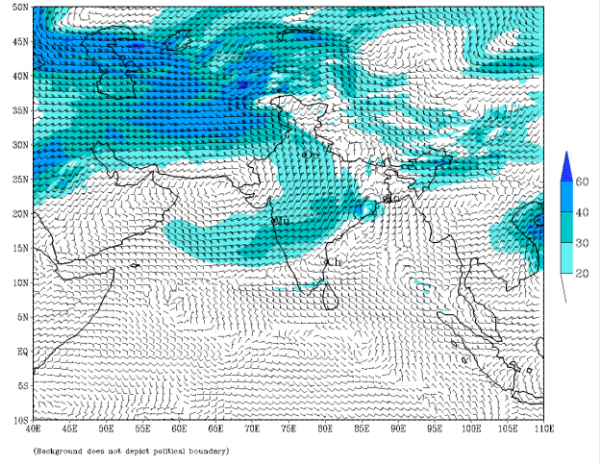
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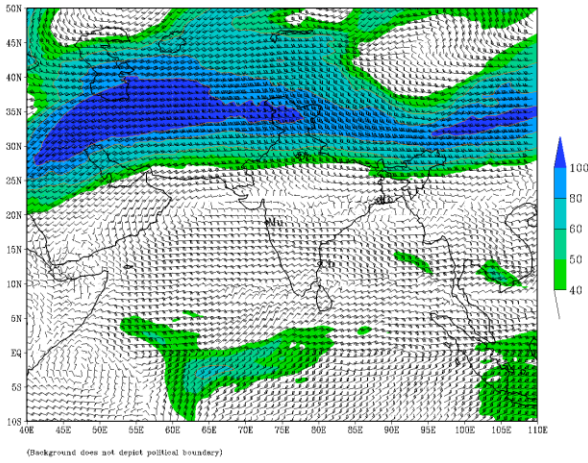
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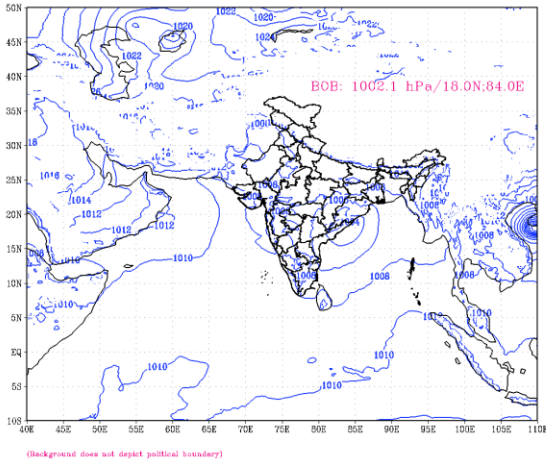
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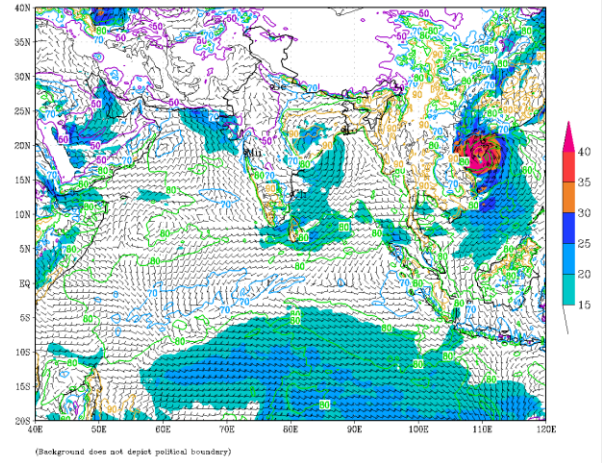
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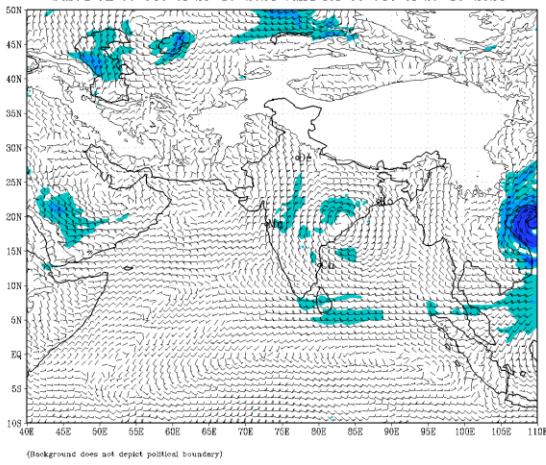
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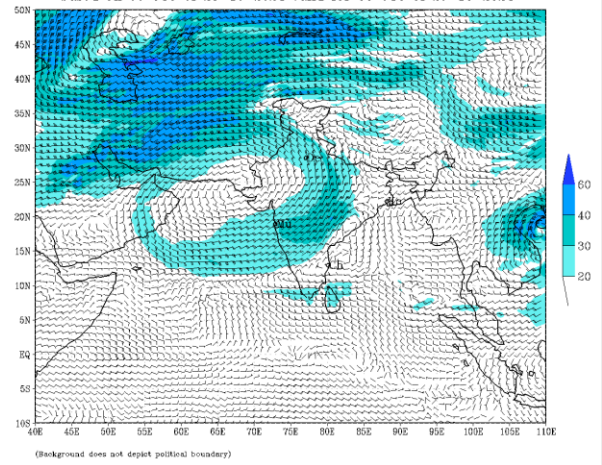
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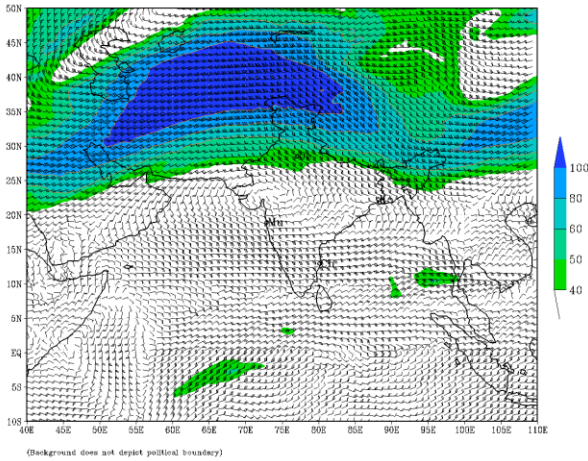
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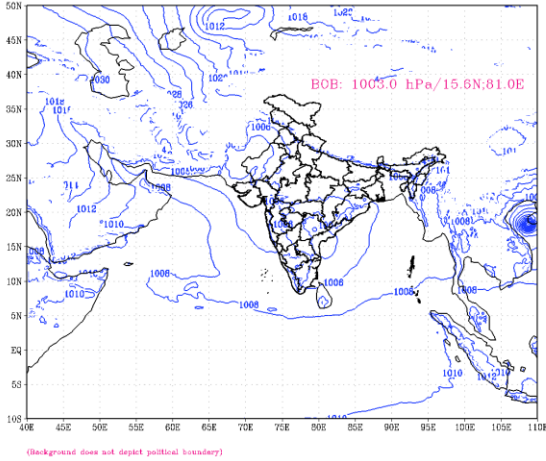
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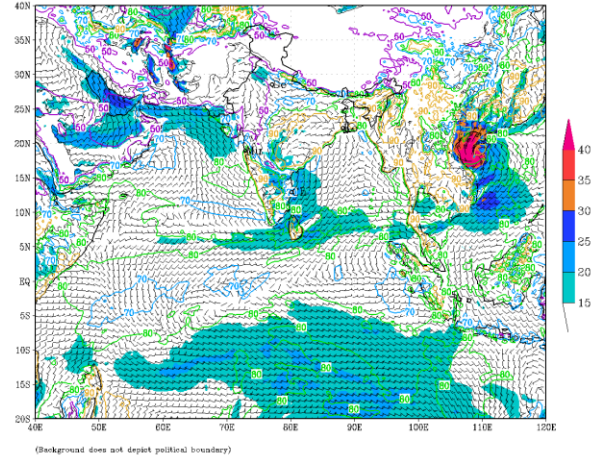
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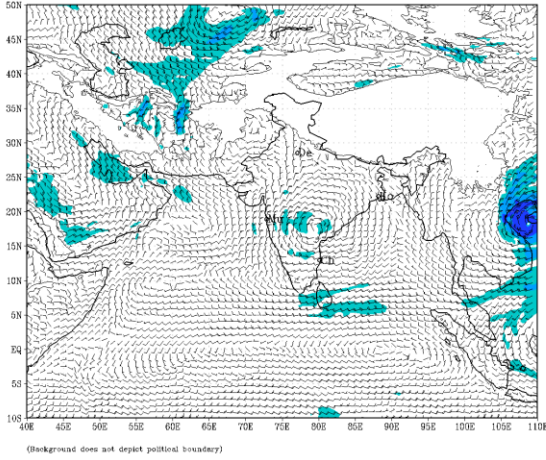
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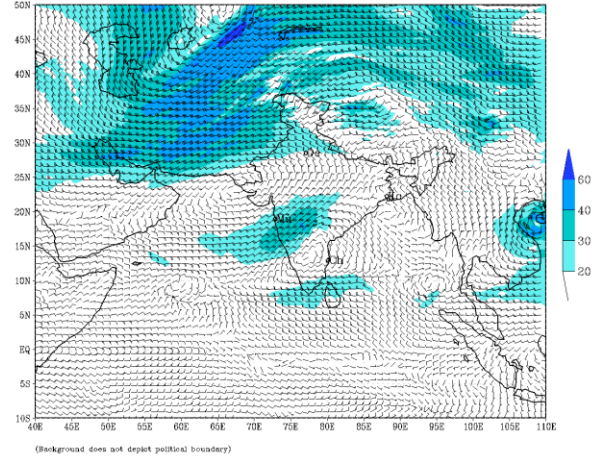
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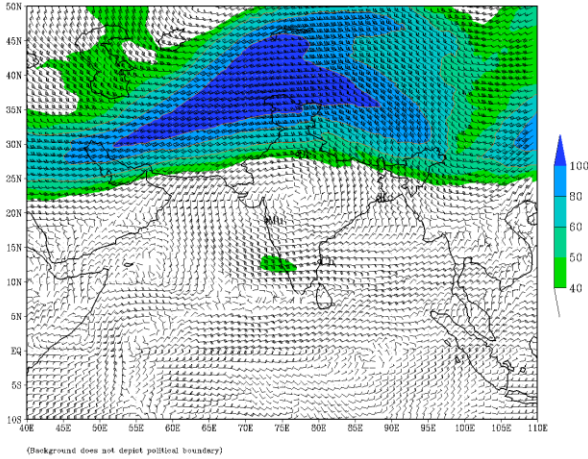
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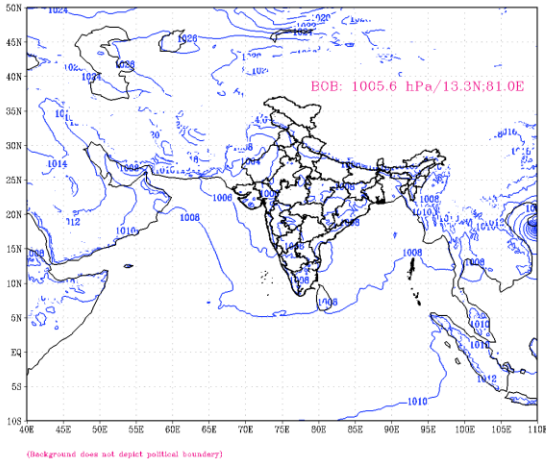
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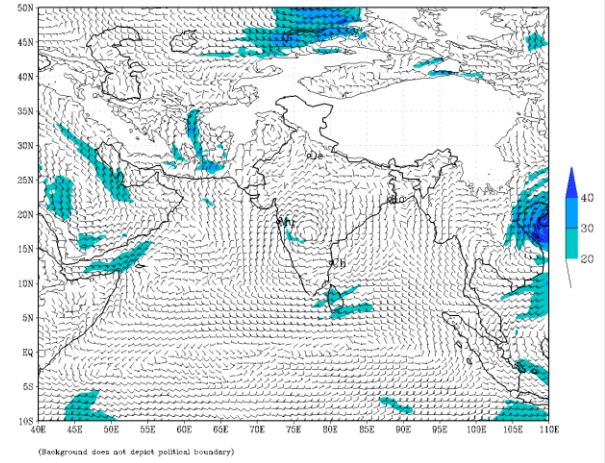
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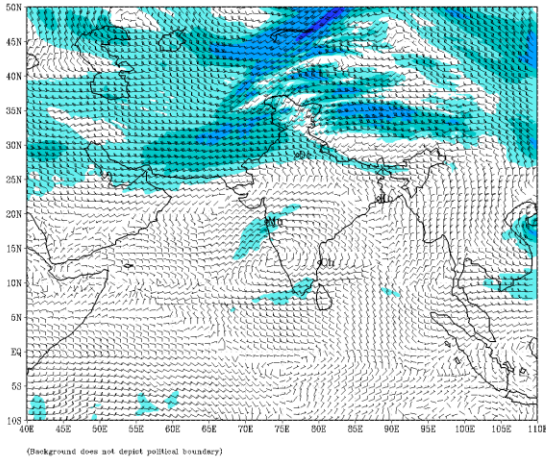
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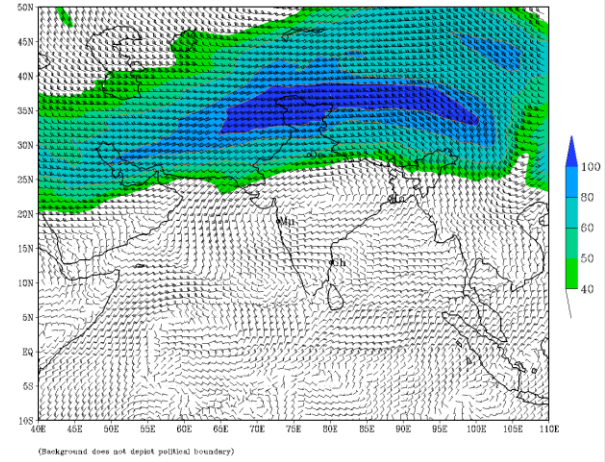
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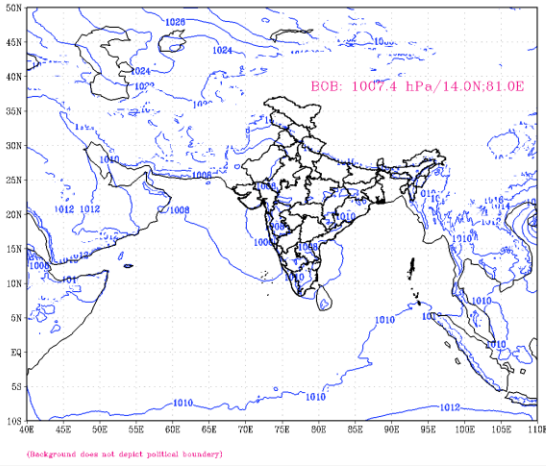
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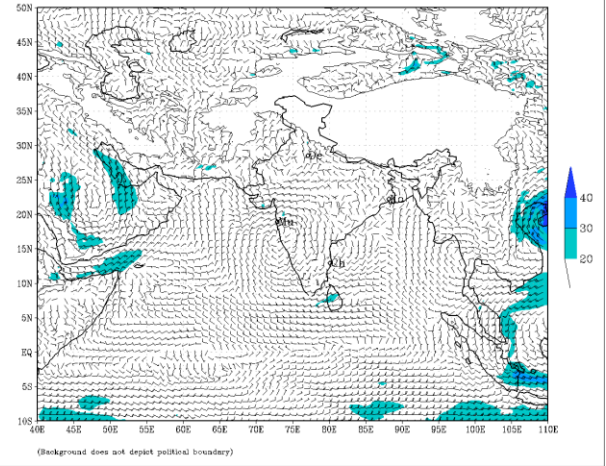
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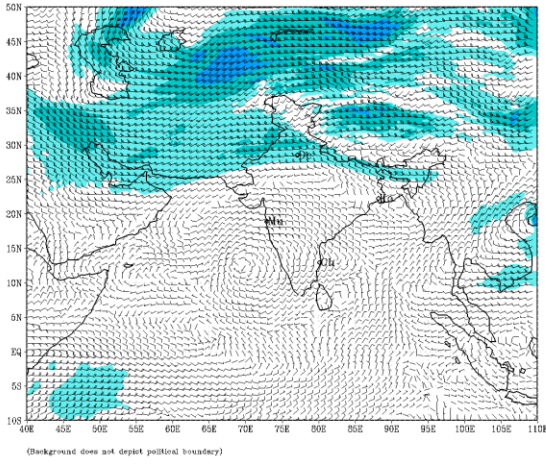
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IMD :GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 23-10-2024 valid for 00 UTC of 30-10-2024



IMD :GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 23-10-2024 valid for 00 UTC of 30-10-2024



IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 23-10-2024 valid for 00 UTC of 30-10-2024

