



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

**Tropical Cyclone Forecast Programme
Report Dated 02nd December, 2022**

Time of Issue: 1200 UTC

Synoptic features (based on 0600 UTC analysis):

- A cyclonic circulation is likely to emerge into south Andaman Sea around 04th December, 2022. Under its influence, a Low Pressure Area is likely to form over Southeast Bay of Bengal & adjoining south Andaman Sea by 05th December. It is likely to move west-northwestwards and concentrate into a Depression over Southeast Bay of Bengal by 07th December morning. Thereafter, it is likely to continue to move west-northwestwards and reach near north Tamil Nadu-Puducherry & adjoining south Andhra Pradesh coasts by 08th December morning.

Dynamical and thermo-dynamical features

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) °C	About 30-32°C over Andaman Sea, entire BoB except small pockets of southwest BoB, and Gulf of Mannar.	About 30-32°C over the southeast and adjoining southwest AS off Karnataka and Kerala, south Gujarat coasts, north AS, 26-28°C over eastcentral and adjoining north AS, along and off Kerala and Karnataka coasts, 25-26°C over southwest AS, less than 24°C over southwest AS off Oman and Yemen coasts and adjoining sea areas.
Tropical Cyclone Heat Potential (TCHP) kJ/cm ²	>110 over south Andaman sea & adjoining southeast BoB, eastcentral BoB, 70-80 over north Andaman Sea, north parts of southwest BoB and adjoining westcentral BoB, off Sri Lanka, north BoB, and less than 40 over westcentral BoB, along and off Andhra Pradesh and Tamil Nadu coasts, west coast of Sri Lanka, Gulf of Mannar, some parts of southwest BoB.	70-90 over southeast and adjoining eastcentral and adjoining southwest AS, and less than 40 over remaining AS and also off west coast of India, Comorin area.
Cyclonic Relative vorticity (X10 ⁻⁶ s ⁻¹)	10-20 over small pockets of westcentral BoB.	10-20 over northeast AS, Comorin and Maldives, southeast AS.
Low Level convergence (X10 ⁻⁵ s ⁻¹)	05 over small pockets of southwest & southeast BoB.	5-10 over southwest AS. 5 over small pocket of southeast AS off north Kerala coast.

Upper Level divergence ($\times 10^{-5} \text{ s}^{-1}$)	5 over small pockets of southeast BoB.	5-10 over southwest AS & along and off Oman coast, 5-10 over southeast AS, 05 over parts of south AS.
Vertical Wind Shear (VWS knots)	10-15 over Andaman Sea, south BoB. 20-40 over central and north BoB.	5-15 over Lakshadweep and Comorin area, southeast, southwest AS & adjoining EIO. 25-50 over central and north AS.
Wind Shear Tendency (knots)	Decreasing over southwest BoB & adjoining EIO.	Decreasing over southeast AS & adjoining EIO, Lakshadweep, Comorin.
Upper tropospheric Ridge	Along 10.0°N over the BoB.	Along 8.0°N over the AS.
Trough in westerlies	No significant trough	

Satellite observations based on INSAT imagery (0300 UTC):

a) Over the BoB & Andaman Sea:-

Scattered to broken low and medium clouds with embedded intense to very intense convection lay over Andaman sea. Scattered low and medium clouds with embedded moderate to intense convection lay over central & south Bay of Bengal.

b) Over the Arabian Sea:-

Scattered to broken low and medium clouds with embedded intense to very intense convection lay over southwest Arabian sea and Comorin area. Scattered low and medium clouds with embedded moderate to intense convection lay over central & southeast Arabian sea. Scattered low and medium clouds with embedded isolated weak to moderate convection lay over northwest Arabian sea.

M.J.O. Index:

The Madden Julian Oscillation (MJO) Index is currently in Phase 1 with amplitude less than 1. It will continue to remain in same phase for 1 day with amplitude less than 1. Thereafter, it would move across phases 2, 3 & 4 with amplitude remaining less than 1.

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

NIL

Model guidance based on 0000 UTC for the next 7 days

MODEL GUIDANCE	Bay of Bengal (BoB)	Arabian Sea (AS)
IMD-GFS	The LPA over south Andaman Sea on 4 th become depression over southeast & adjoining South Andaman Sea on 5 th Dec/0000 UTC, move west-northwestwards, intensify into a cyclonic storm at 1200 UTC of 5 th over southeast BoB, into a severe cyclonic storm (SCS) over southeast BoB on 6 th Dec /0000 UTC and into a very severe cyclonic storm (VSCS) over southwest BoB on 7 th /0000 UTC. It is making landfall on 7 th /1500 UTC near Nellore.	No significant system

IMD-GEFS	The LPA over south Andaman Sea on 4 th become depression over southeast & adjoining South Andaman Sea on 5 th Dec/0000 UTC, move west-northwestwards, intensify into a deep depression at 1200 UTC of 5 th over southeast & adjoining southwest BoB, into a severe cyclonic storm (SCS) over southwest BoB on 6 th Dec /1200 UTC and severe cyclonic storm (SCS) over southwest BoB near North Tamil Nadu, on 7 th /1200 UTC. It is making landfall on 7 th /1500 UTC near 12.5N/80E and lay as a cycir over south tamil nadu region on 8 th /1200 UTC	No significant system
GEFS Probabilistic guidance	Not available	Not available
IMD WRF	The LPA over south Andaman Sea on 4 th , to become depression over southeast & adjoining South Andaman Sea on 5 th Dec/0000 UTC,	No significant system within forecast duration.
NCMRWF-NCUM	Cyclonic circulation over Gulf of Thailand on 3 rd Dec, to emerge into South Andaman Sea on 4 th Dec morning, low pressure area over southeast BoB on 5 th , WML over southeast BoB on 6 th , WML/depression over southwest BoB on 7 th , Depression over southwest BoB to the southeast of Chennai on 8 th , WML over southwest BoB near Puducherry on 9 th /0000 UTC.	No significant system
NCMRWF-NEPS	Cyclonic circulation over Gulf of Thailand on 3 rd Dec, to emerge into South Andaman Sea on 4 th Dec morning, cycir over southeast BoB on 5 th , LPA over southwest BoB on 6 th , WML/depression over southwest BoB on 7 th , Depression over southwest BoB to the southeast of Chennai on 8 th , crossing coast as an LPA near 11.5/80E on 9 th /0000 UTC.	No significant system
NCMRWF-UM (Regional)	Cyclonic circulation over Gulf of Thailand on 3 rd Dec, to emerge into South Andaman Sea on 4 th Dec morning, low pressure area over southeast BoB on 5 th	No significant system
ECMWF	A cyclonic circulation from Gulf of Thailand to emerge into south Andaman Sea on 4 th Dec morning, low pressure area over the south Andaman Sea on 5 th , WML/depression over southeast BoB on 6 th , Depression over southeast BoB on 7 th , cyclonic storm over southwest BoB on 8 th /0000 UTC, system to maintain peak intensity during 8 th /0000 to 8 th /1200 UTC. Thereafter, slight weakening is indicated. System to lie as DD/ marginal CS over southwest BoB with north-northwestwards movement. Crossing near 14.5/80.0 around 09/1500 UTC as a WML/depression.	No significant system

ECMWF ensemble	Likely cyclogenesis over South Andaman Sea around 4 th Dec, will track west-northwest wards with intensification up to Cyclonic Storm with 70-80% probability on 7 th Dec.	No significant system
NCEP-GFS	A cyclonic circulation from Gulf of Thailand is likely to emerge into South Andaman Sea on 4 th Dec morning. It will move west-northwestward and become an LPA over south Andaman Sea on 5 th Dec., WML over southwest BoB on 6 th , CS on 7 th Dec over southwest BoB. Continuing to move west-northwestwards, crossing North Tamil Nadu – Puducherry coast as a Depression on 10 th Dec./0600 UTC	No significant system
IMD MME	Cycir over South Andaman Sea on 3 rd & 4 th , LPA over south Andaman Sea on 5 th , Depression on 6 th over southeast BoB, to move west-northwestwards till 8 th /1200 UTC and north-northwestwards thereafter. Crossing on 9 th /0300 UTC near 11.8/79.8. Model is also indicating that the system would intensify into a CS on 7 th /0000 UTC. Maintain peak intensity till 7 th /1200 UTC and start weakening thereafter.	No significant system
IMD HWRF	Available during cyclonic disturbance period only	Available during cyclonic disturbance period only
IMD-Genesis Potential Parameter	No potential zone over Bay of Bengal till 4 th December. A significant potential zone over south Andaman Sea on 5 th Dec having west-northwestward movement.	No potential zone over Arabian Sea during next 7 days

Summary and conclusion:

- Most of the NWP models are indicating likely emergence of a cyclonic circulation over South Andaman Sea on 4th, LPA over southeast BoB and adjoining South Andaman Sea around 5th Dec.. All the models are unanimously indicating west-northwestward movement of system with intensification into depression around 7th (ECMWF on 7th, GFS on 6th, NCUM on 7th). ECMWF & GFS are indicating intensification into a cyclonic storm with ECMWF indicating intensification upto CS stage during 08/0000 UTC to 08/1200 UTC; GFS is indicating intensification upto very severe cyclonic storm stage and NCUM upto depression/deep depression stage. Landfall time is also varying significantly with GFS showing landfall around 7th/1500 UTC, ECMWF around 9th/1500 UTC and NCUM around 9th/0600 UTC.

In view of all the above, it is inferred that

1. For the Bay of Bengal:

A cyclonic circulation is likely to emerge into South Andaman Sea around 4th Dec. Under its influence a low pressure area is likely to form over southeast Bay of Bengal and adjoining south Andaman Sea around 5th Dec. It is likely to move west- northwestwards and concentrate into a depression over southeast Bay of Bengal by 7th December. Thereafter, it is likely to continue to move west-northwestwards and reach near Tamil Nadu- Puducherry and adjoining South Andhra Pradesh coasts by 8th December morning.

2. For the Arabian Sea:

No significant system during next 7 days

Probability of cyclogenesis (formation of depression and above intensity systems) over the BAY OF BENGAL of Bengal and Andaman 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	LOW	MOD	HIGH	HIGH

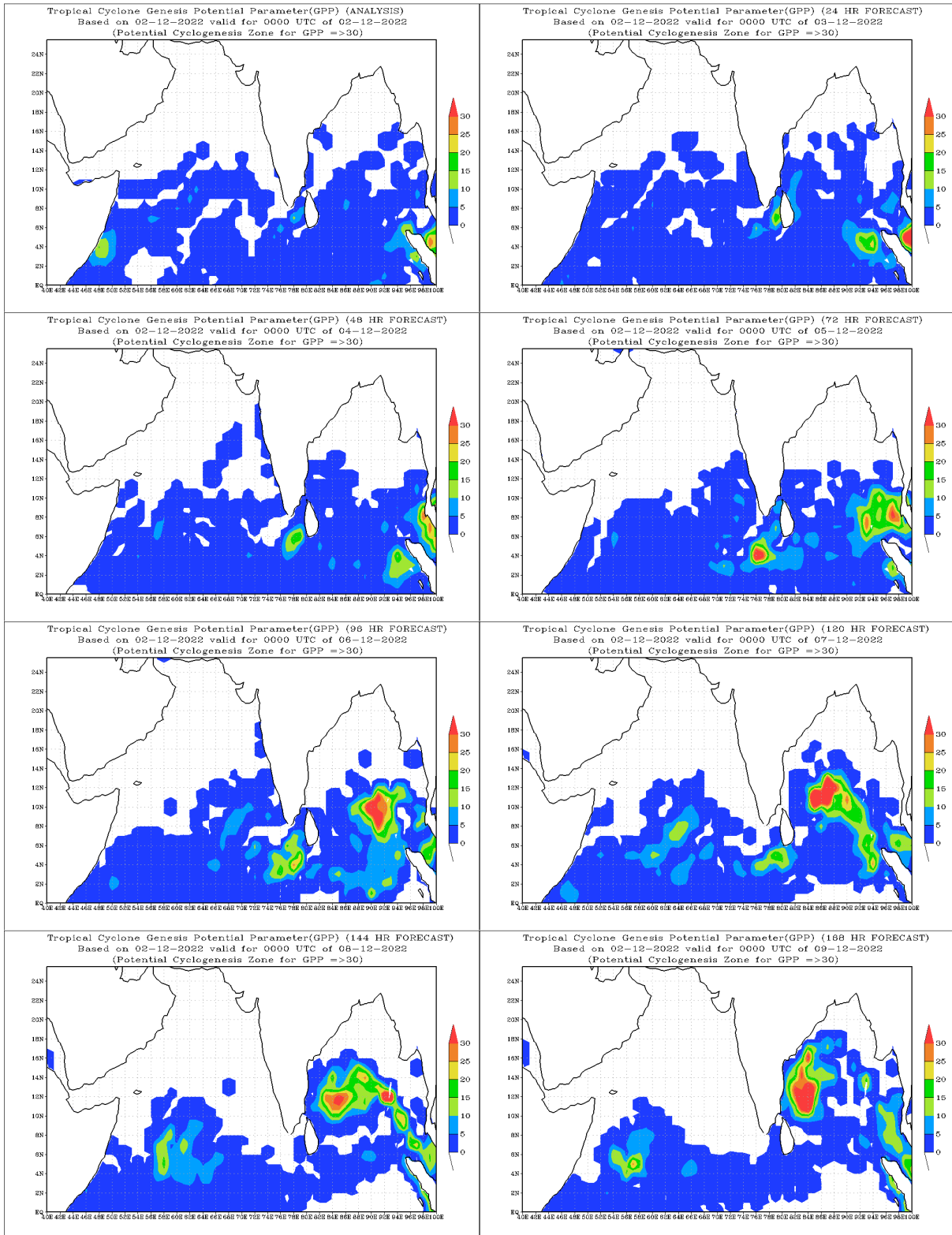
Probability of cyclogenesis (formation of depression and above intensity systems) over the Arabian Sea during next 168 hours:

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

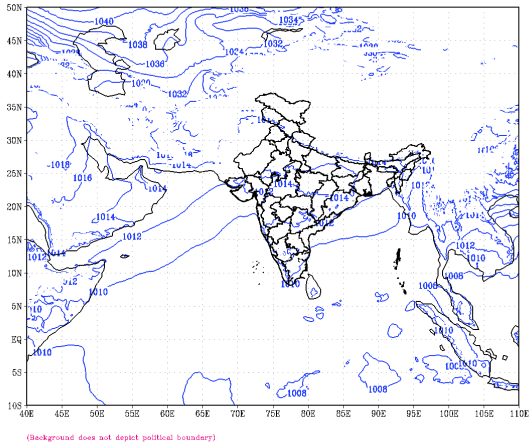
Advisory:

The movement and intensification of low pressure area/depression (remnant from South China Sea) likely to emerge into south Andaman Sea around 4th December need to be monitored through various observations.

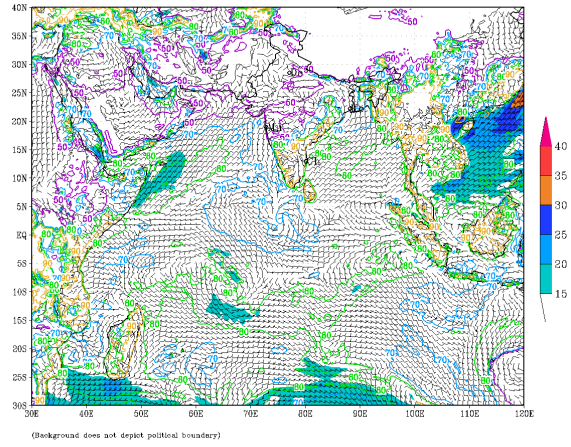
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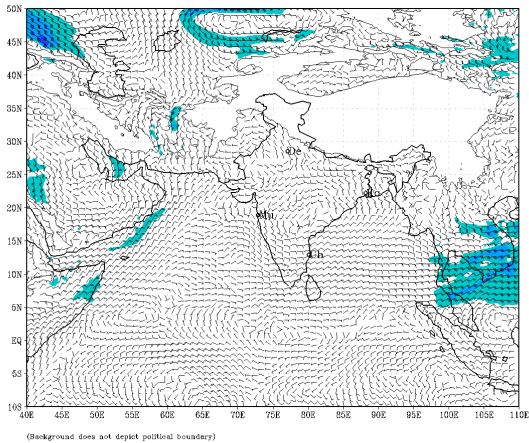
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based on 00 UTC of 02-12-2022 valid for 00 UTC of 02-12-2022



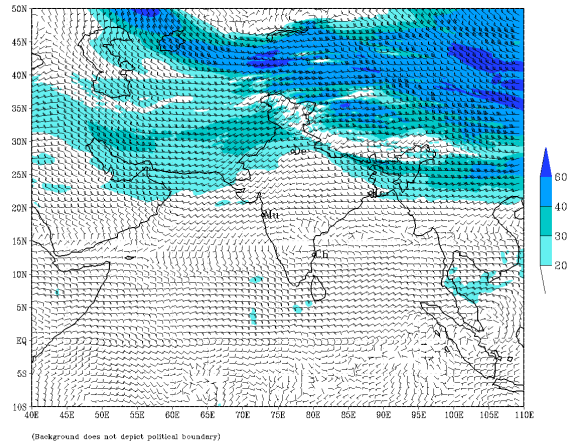
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)
based on 00 UTC of 02-12-2022 valid for 00 UTC of 02-12-2022



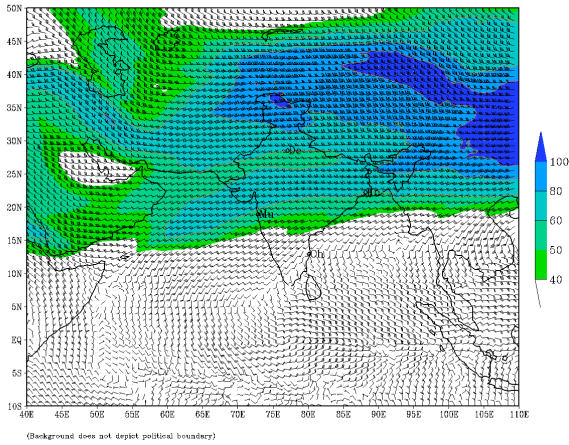
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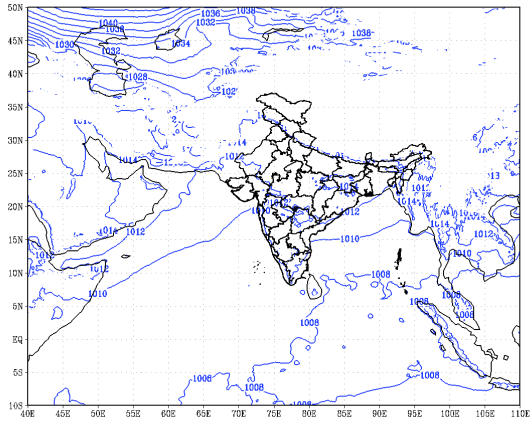
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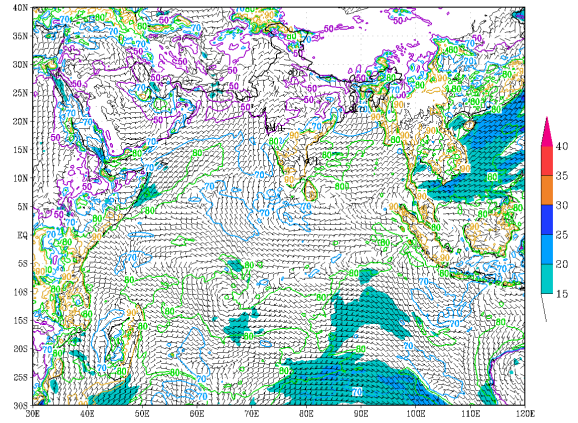


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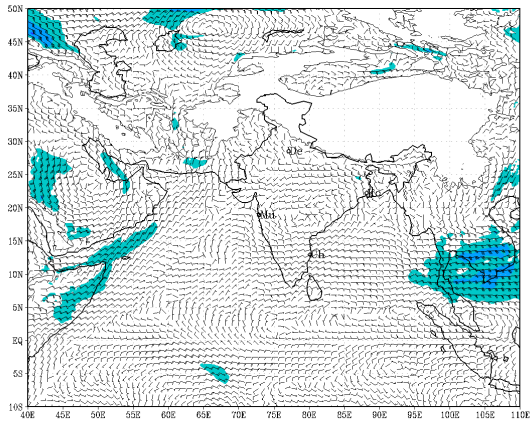
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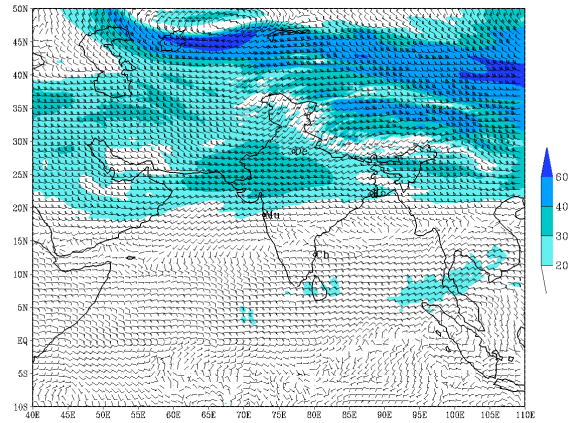
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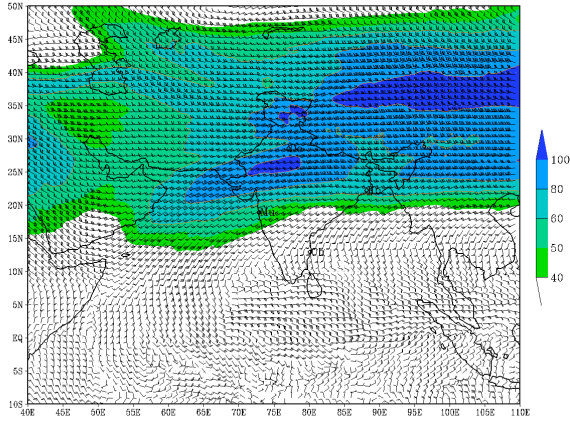
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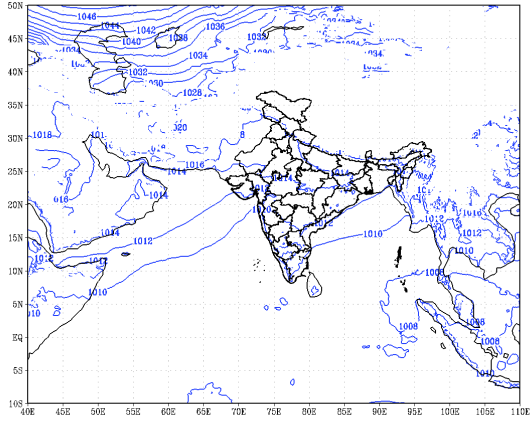
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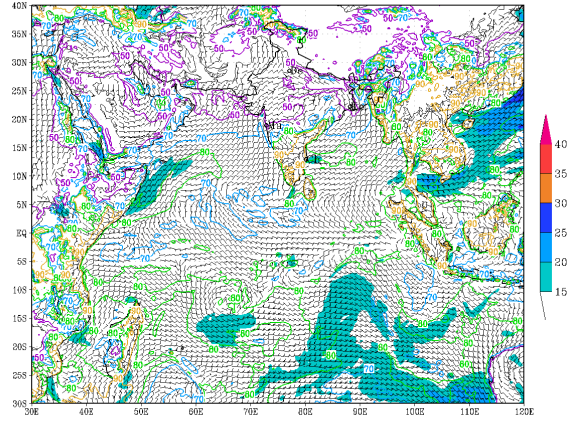
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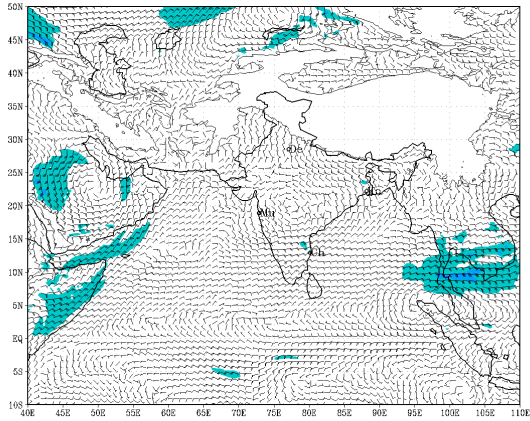
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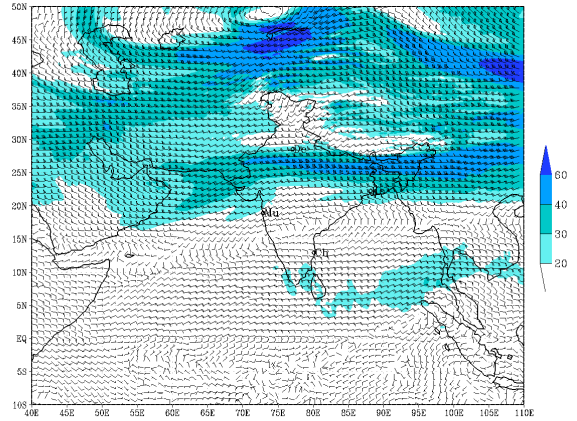
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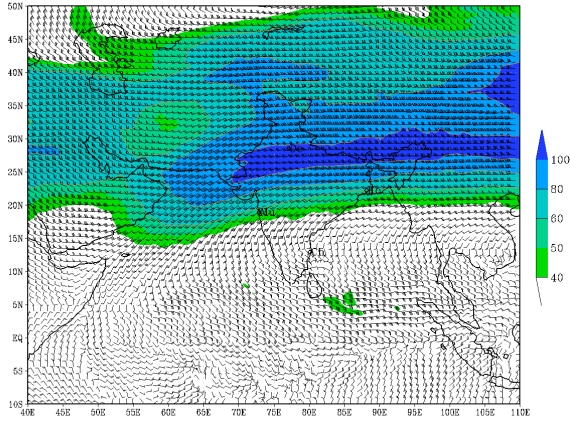
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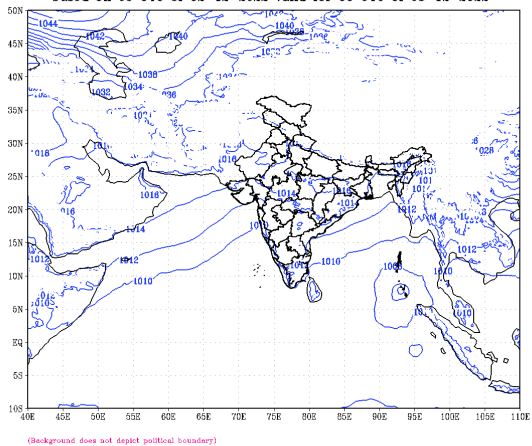
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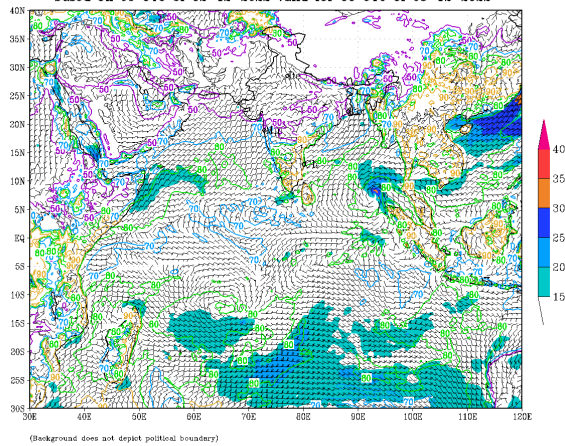


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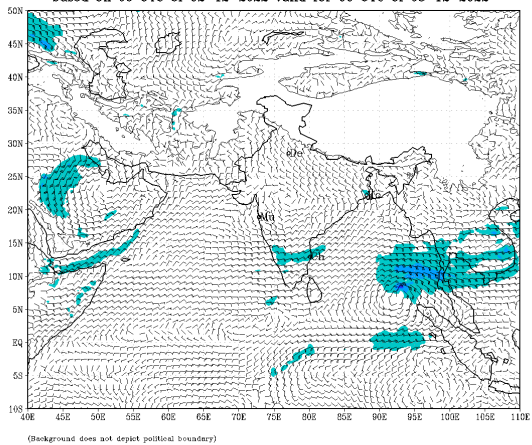
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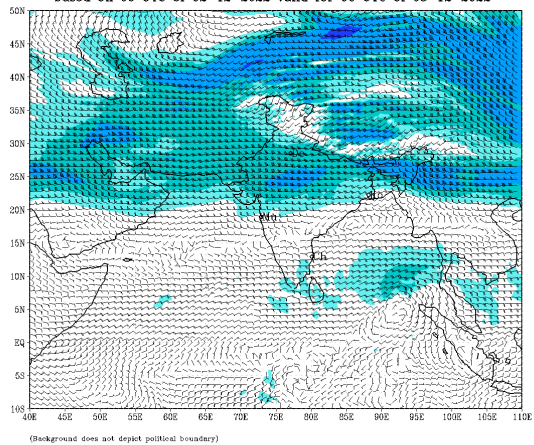
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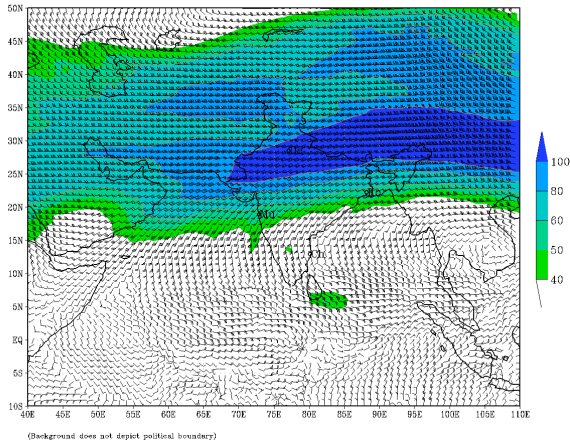
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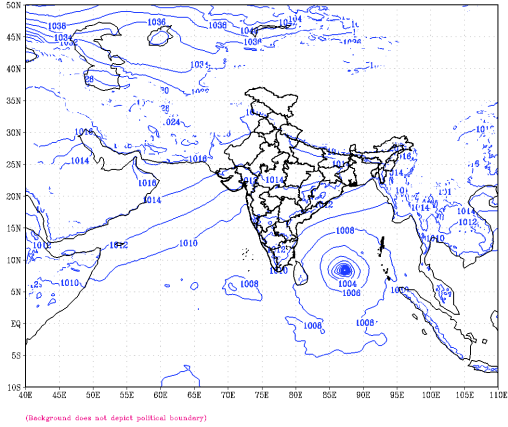
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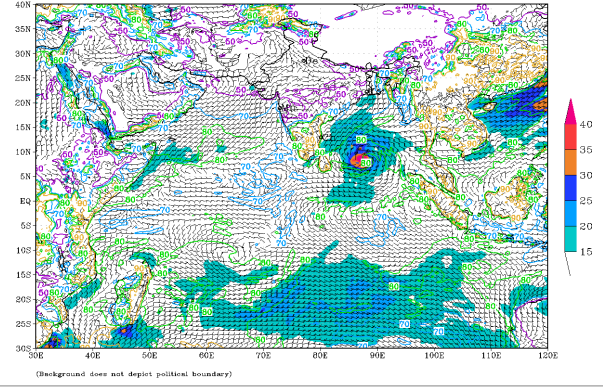
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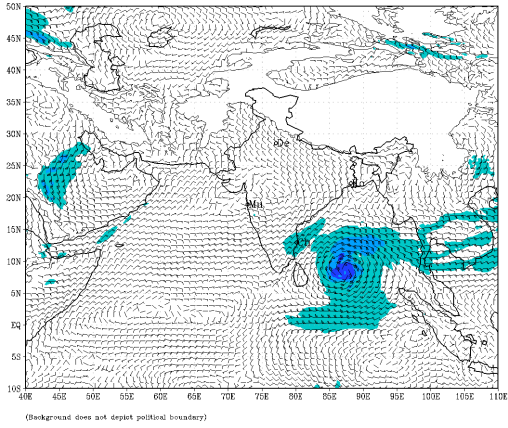
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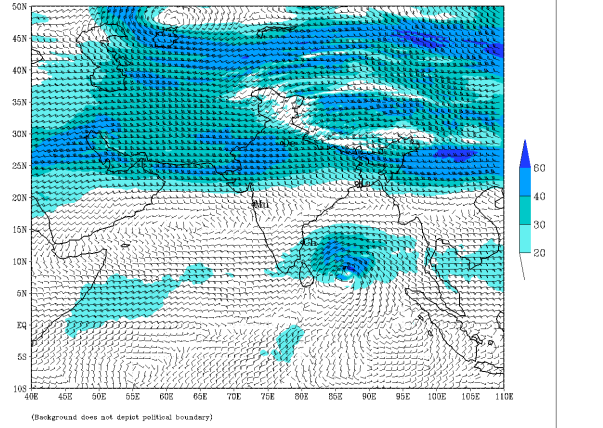
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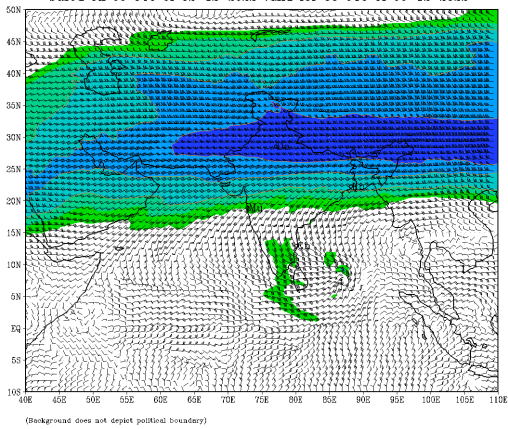
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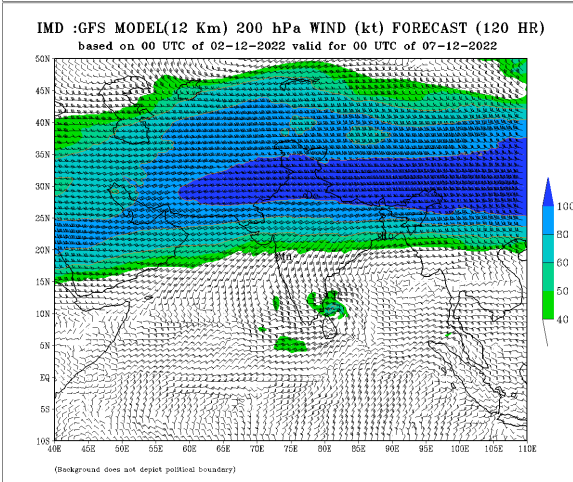
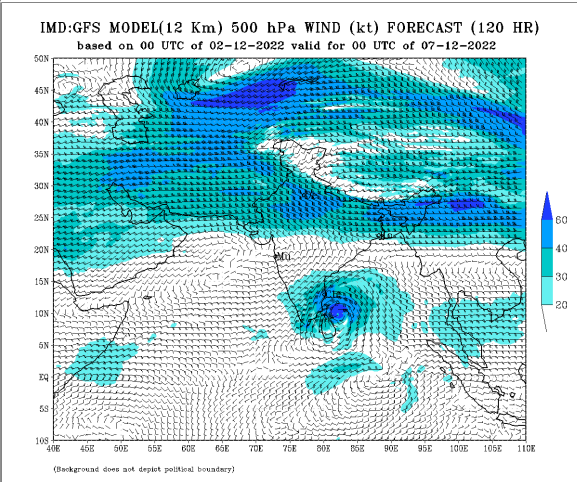
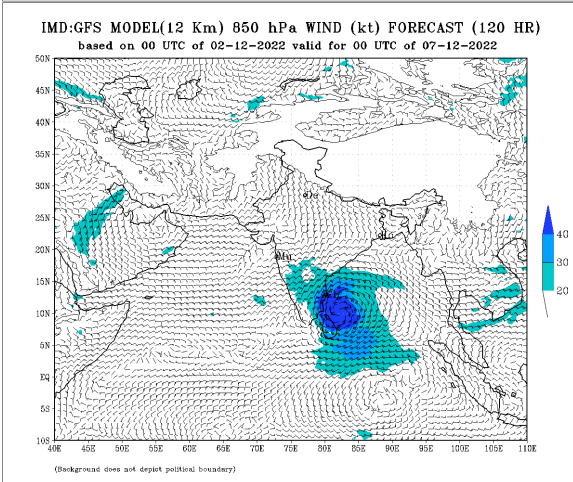
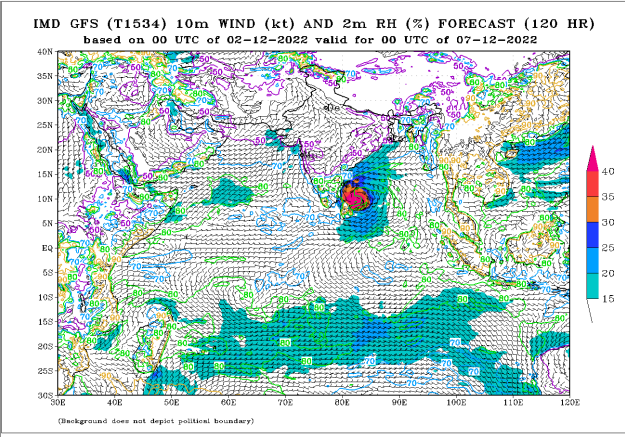
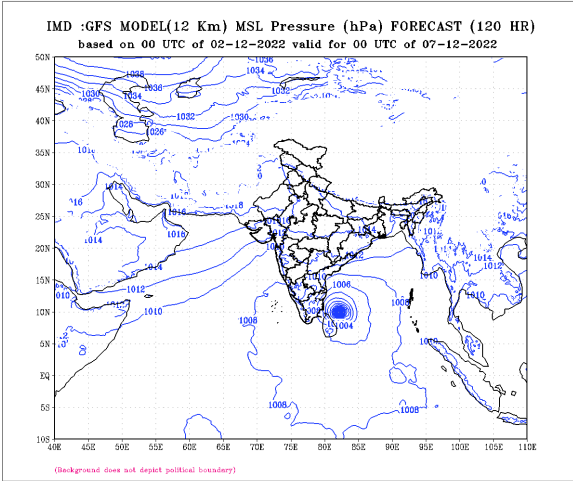


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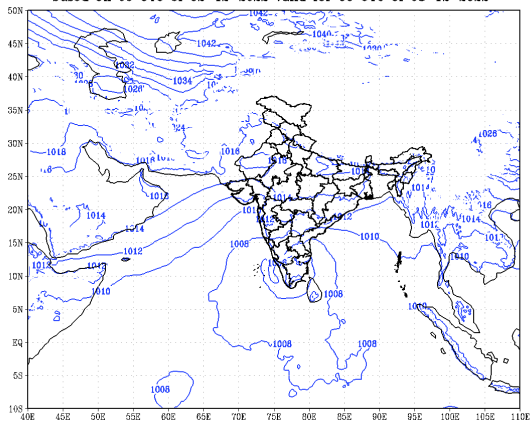


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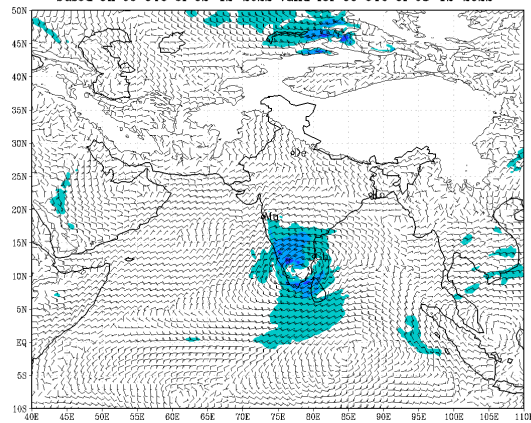


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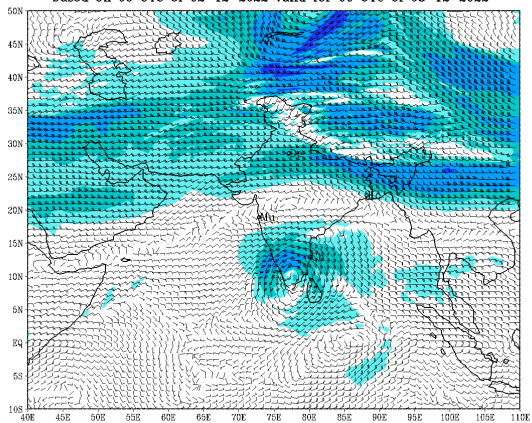
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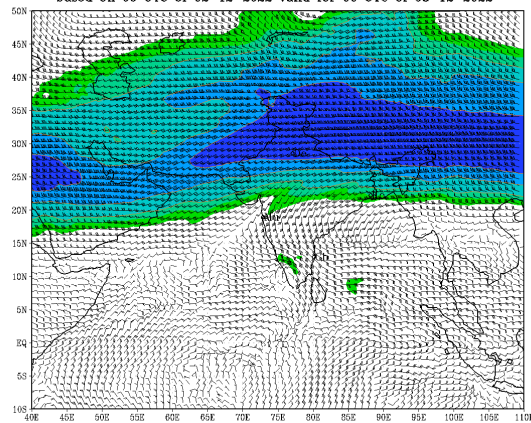
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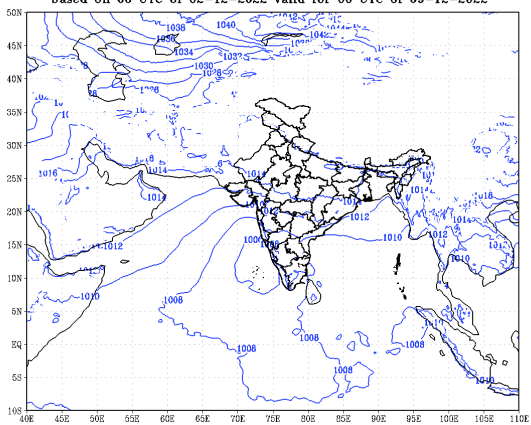
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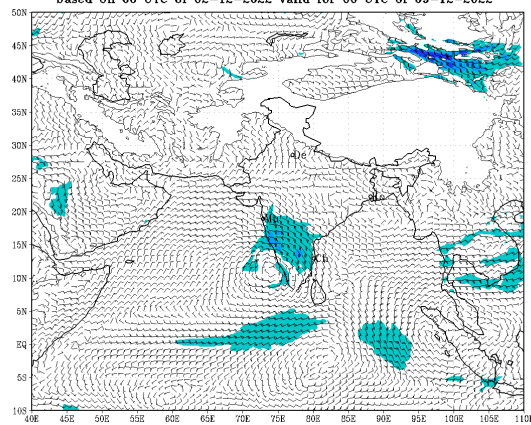
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based on 00 UTC of 02-12-2022 valid for 00 UTC of 09-12-2022



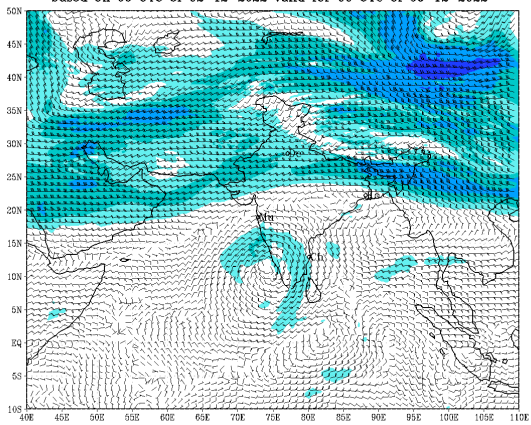
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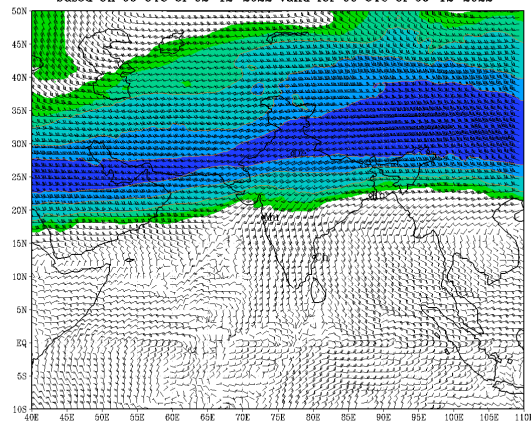
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