



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

**Tropical Cyclone Forecast Programme
Report Dated 12th December 2022**

Time of Issue: 1200 UTC

Synoptic features (based on 0600 UTC analysis):

- ❖ Yesterday's cyclonic circulation over north interior Tamil Nadu and adjoining South Interior Karnataka & north Kerala lay over north Kerala & neighbourhood at 0830 hours IST/0300 UTC of today, the 12th December. It is very likely to emerge into southeast & adjoining eastcentral Arabian Sea off north Kerala-Karnataka coast. Under its influence, a Low Pressure Area is likely to form over the same region around 13th December and move west-northwestwards away from the Indian coast thereafter.
- ❖ A cyclonic circulation is likely to emerge into South Andaman Sea around 13th December.

Dynamical and thermo-dynamical features

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) °C	Around 28-30°C over almost entire BoB, 26-28°C over southwestern parts of southwest BoB, Gulf of Mannar.	About 28-30°C over the southeast and adjoining eastcentral, southwest AS, along and off south Gujarat, Maharashtra coasts, north AS. About 26-28°C over along and off Kerala, Karnataka coasts, central AS, southwest AS. Less than 24°C along and off Oman and Yemen coasts and adjoining sea areas.
Tropical Cyclone Heat Potential (TCHP) kJ/cm²	90-100 over eastcentral BoB, 90-100 over south Andaman Sea and adjoining southeast BoB. Less than 40 along the Andhra Pradesh and Tamil Nadu coasts, Gulf of Mannar, western 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 (X10⁻⁶s⁻¹)	40-50 over along and off south Tamil Nadu coast, Gulf of Mannar, 20-30 over southern parts of southwest BoB.	60-80 over along and off Kerala coast, 20-30 over central parts of AS, southwest AS, along and off north Gujarat coast and adjoining sea areas.
Low Level convergence (X10⁻⁵ s⁻¹)	5 over small pockets of westcentral & southwest BoB	5-10 over southeast AS and adjoining EIO. 5 over small pockets of southwest AS.
Upper Level divergence (X10⁻⁵ s⁻¹)	5-10 over southwest BoB off Tamil Nadu coast.	10-20 over southeast AS and off Kerala coast.

Vertical Wind Shear (VWS knots)	15-20 over central & adjoining southwest parts of BoB, 20-30 over north BoB and adjoining central BoB.	10-15 over south AS and adjoining central AS, 25-40 over north and adjoining central AS.
Wind Shear Tendency (knots)	Decreasing over southwest BoB, increasing over central BoB and Andaman Sea.	Decreasing over most parts of AS & adjoining EIO.
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 (0600 UTC):

a) Over the BoB & Andaman Sea: -

Scattered to broken low and medium clouds with embedded intense to very intense convection lay over southwest Bay of Bengal off north Tamil Nadu coast and south Andaman sea. Scattered low and medium clouds with embedded moderate to intense convection lay over southeast Bay of Bengal and rest of Andaman sea.

b) Over the Arabian Sea: -

Scattered to broken low and medium clouds with embedded intense to very intense convection lay over eastcentral Arabian sea off Karnataka coast. Scattered to broken low and medium clouds with embedded moderate to intense convection lay over south Arabian sea, Lakshadweep islands area and Comorin area. Scattered to broken low and medium clouds with embedded weak to moderate convection lay over rest of eastcentral Arabian Sea.

M.J.O. Index:

The Madden Julian Oscillation (MJO) Index is currently in Phase 5 with amplitude less than 1. It will be in phase 6 tomorrow. Thereafter, it will move to phase 6, 7, 8 for next 5 days.

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	A cyclonic circulation over South Andaman Sea on 13 th with nearly westwards movement and no significant intensification	A cycir over southeast and adjoining eastcentral AS, adjoining Kerala-karnaataka coast on 12 th Dec. Under its influence, a LPA will form over southeast and adjoining eastcentral AS on 13 th Dec and it will have west-northwest ward movement till 15 th Dec.
IMD-GEFS	A cyclonic circulation over South Andaman Sea on 13 th with nearly westwards movement and no significant intensification	A cycir over southeast and adjoining eastcentral AS, adjoining Kerala-karnaataka coast on 12 th Dec. Under its influence, a LPA will form over southeast and adjoining eastcentral AS on 13 th Dec and it will have west-northwest ward movement till 14 th Dec.
GEFS Probabilistic guidance	-	-
IMD WRF	A cyclonic circulation over South Andaman Sea on 13 th with nearly westwards movement and no	A cycir over southeast and adjoining eastcentral AS, adjoining Kerala-karnaataka coast on 12 th Dec. Under its influence, a LPA will form over southeast and adjoining eastcentral AS on 13 th Dec and it will

	significant intensification	have west-northwest ward movement till 14 th Dec.
NCMRWF-NCUM	A cyclonic circulation over South Andaman Sea on 14 th with nearly westwards movement and no significant intensification	A cycir over southeast and adjoining eastcentral AS, adjoining Kerala-karnaataka coast on 12 th Dec. Under its influence, a LPA will form over southeast and adjoining eastcentral AS on 13 th Dec, and it will have west-northwest ward movement, becoming depression on 15 th Dec, moving west-northwestwards towards Gulf of Aden till 19 th Dec.
NCMRWF-NEPS	A cyclonic circulation over South Andaman Sea on 14 th with nearly westwards movement and no significant intensification	A cycir over southeast and adjoining eastcentral AS, adjoining Kerala-karnaataka coast on 12 th Dec. Under its influence, a LPA will form over southeast and adjoining eastcentral AS on 13 th Dec, and it will have west-northwest ward movement, becoming depression on 15 th Dec, moving west-northwestwards towards Gulf of Aden till 19 th Dec.
NCMRWF-UM (Regional)	A cyclonic circulation over South Andaman Sea on 14 th with nearly westwards movement and no significant intensification	A cycir over southeast and adjoining eastcentral AS, off Kerala-Karnaataka coast on 12 th Dec. Under its influence, a LPA will form over southeast and adjoining eastcentral AS on 13 th Dec, and it will have west-northwest ward movement, becoming depression on 13 th Dec and continuing in same direction.
ECMWF	A cyclonic circulation over South Andaman Sea on 14 th with nearly westwards movement and no significant intensification	A cycir over southeast and adjoining eastcentral AS, off Kerala-karnaataka coast on 12 th Dec. Under its influence, a LPA will form over the same region on 13 th Dec, and it will have west-northwest ward movement and slight intensification over central Arabian Sea during 15 th -16 th .
ECMWF ensemble	-	-
NCEP-GFS	A cyclonic circulation over South Andaman Sea on 13 th with nearly westwards movement and no significant intensification	A cycir over southeast and adjoining eastcentral AS, off Kerala-karnaataka coast on 12 th Dec. Under its influence, a LPA will form over the same region on 13 th Dec, and it will have west-northwest ward movement till 15 th Dec.
IMD MME	No guidance	No guidance
IMD HWRF	No guidance	No guidance
IMD-Genesis Potential Parameter	-	A potential zone over southeast and adjoining eastcentral AS, off Kerala-Karnataka coast on 12 th Dec will have its west-northwest ward movement till 17 th Dec.

Summary and conclusion:

- ❖ All the models are unanimously indicating a cyclonic circulation over southeast and adjoining eastcentral Arabian Sea on 13th December. Most of the models are showing its west-northwestward movement till 16th December without significant intensification. However NCUM, NEPS and ECMWF are indicating slight intensification of this system into a depression over central Arabian Sea during 15th – 17th December with west-northwestwards movement towards Gulf of Aden.
- ❖ Most of the models are also indicating likely emergence of a cyclonic circulation over South Andaman Sea around 13th/14th with nearly westwards movement and no significant intensification.

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 13th December.

2. For Arabian Sea:

The cyclonic circulation over north Kerala & neighbourhood is very likely to emerge into southeast & adjoining eastcentral Arabian Sea off north Kerala-Karnataka coast. Under its influence, a Low Pressure Area is likely to form over the same region around 13th December and move west-northwestwards away from the Indian coast thereafter. However, in view of model guidance from NCUM and ECMWF, LOW (1-25%) probability is assigned to formation of depression over central Arabian Sea during 15th-17th December.

Probability of cyclogenesis (formation of depression and above intensity systems) over the BAY OF BENGAL of Bengal and Andaman Sea during next 168 hours

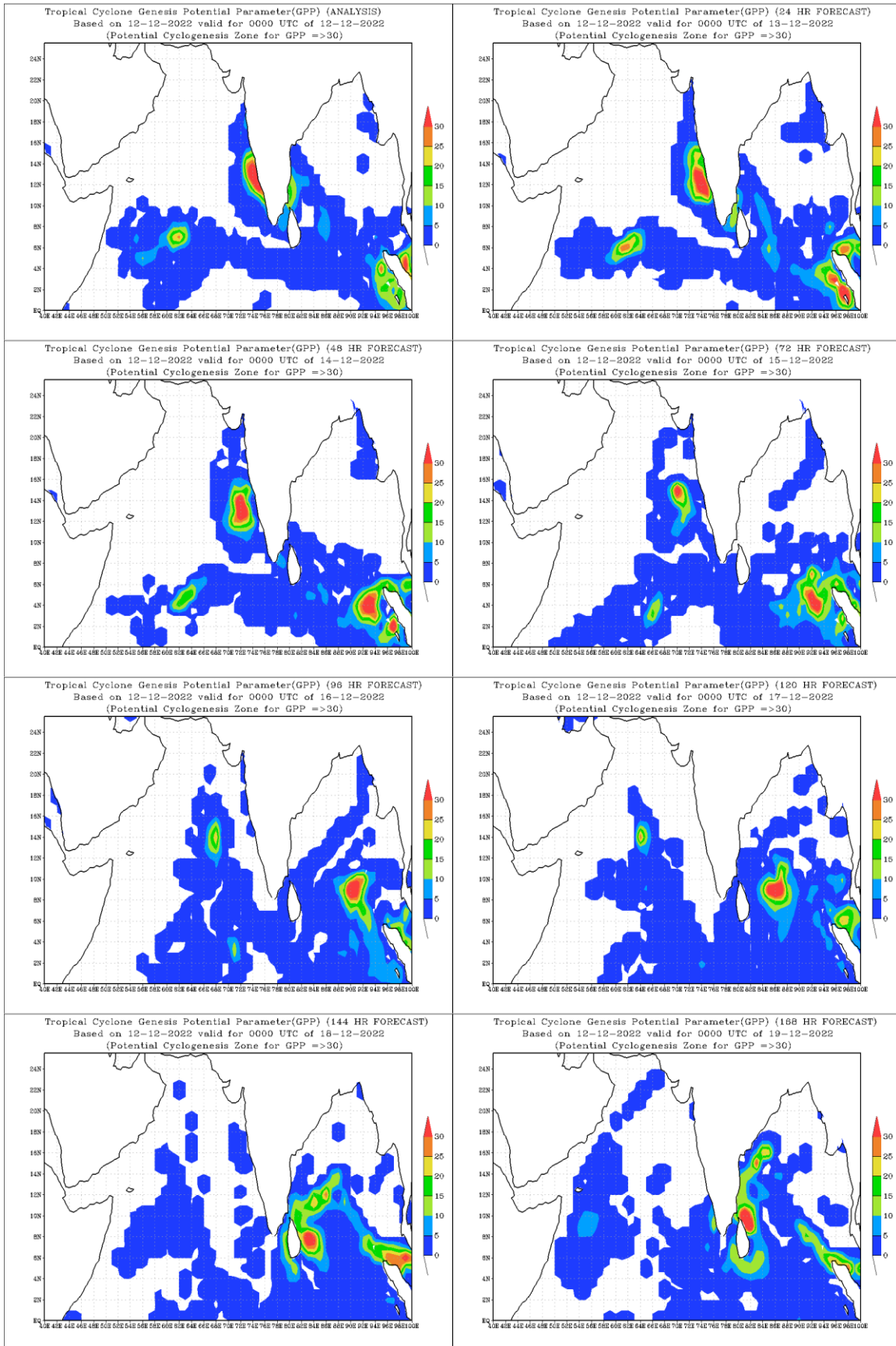
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	NIL	NIL	NIL	NIL

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

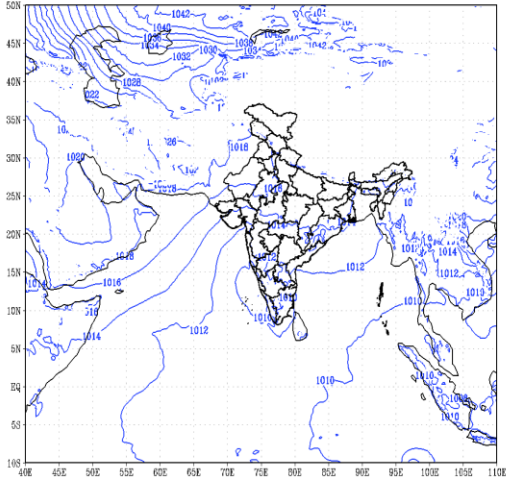
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	LOW	LOW	NIL	NIL

Advisory: The movement and intensification of both the systems need to be monitored.

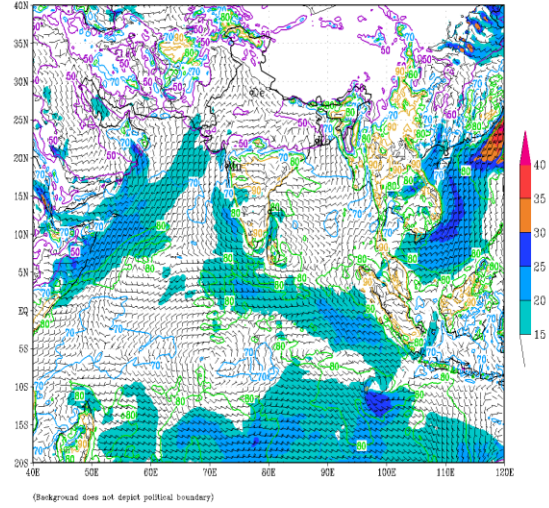
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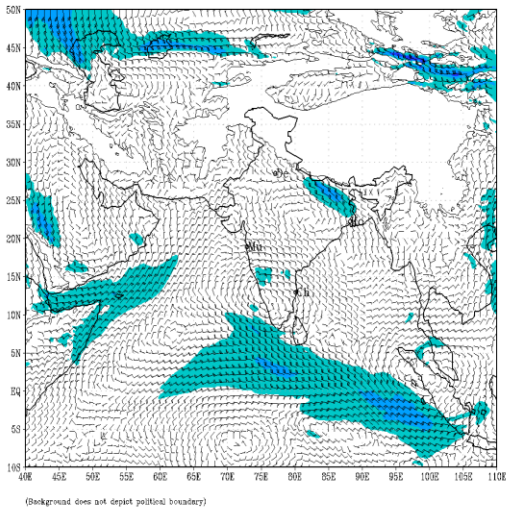
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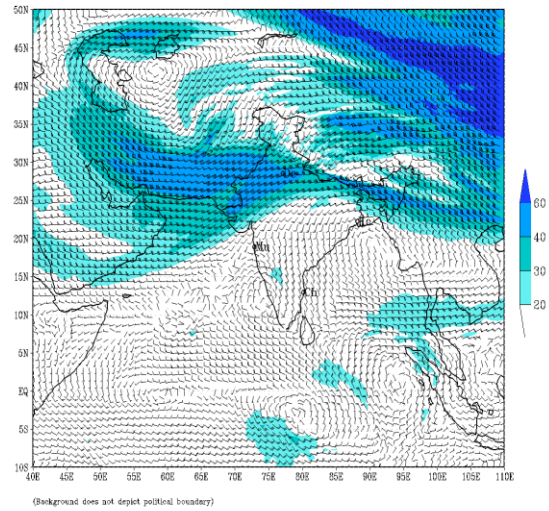
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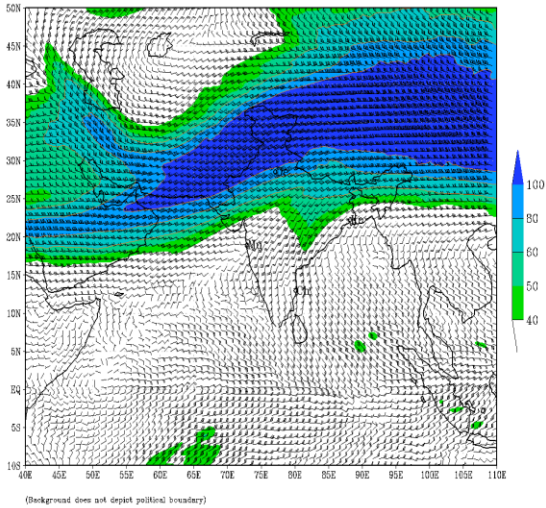
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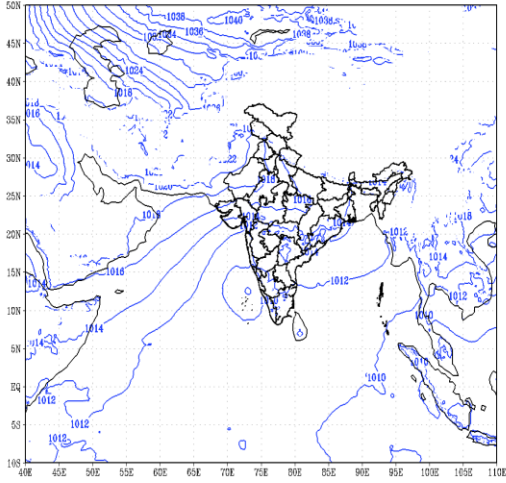
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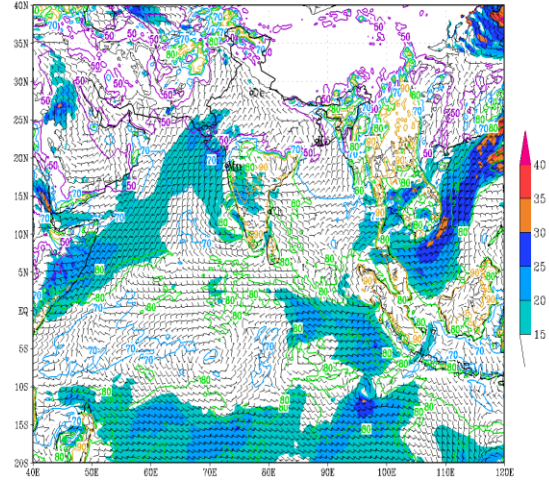


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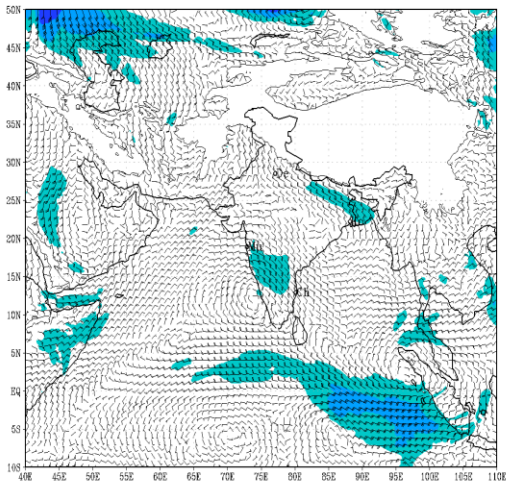
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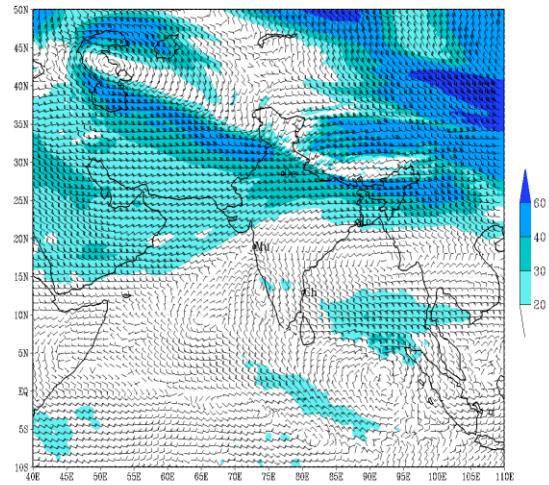
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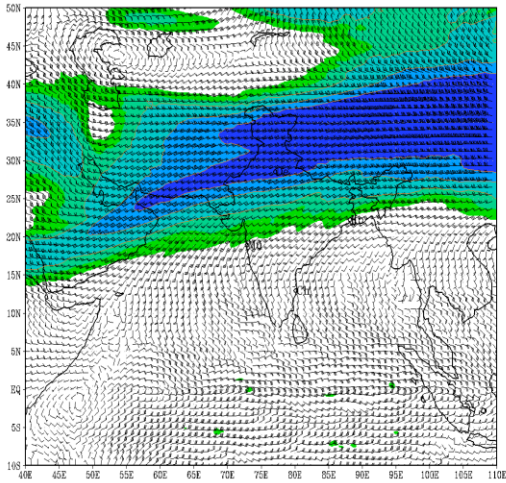
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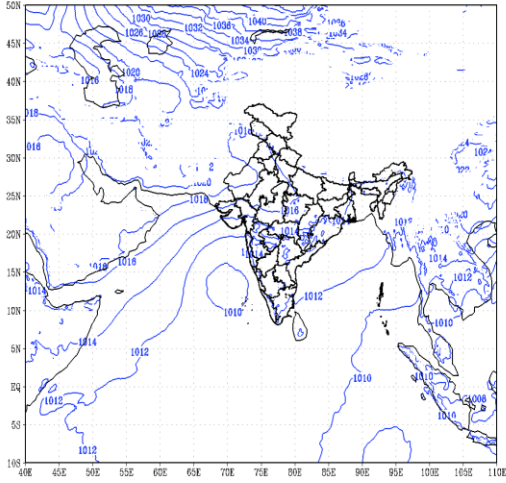
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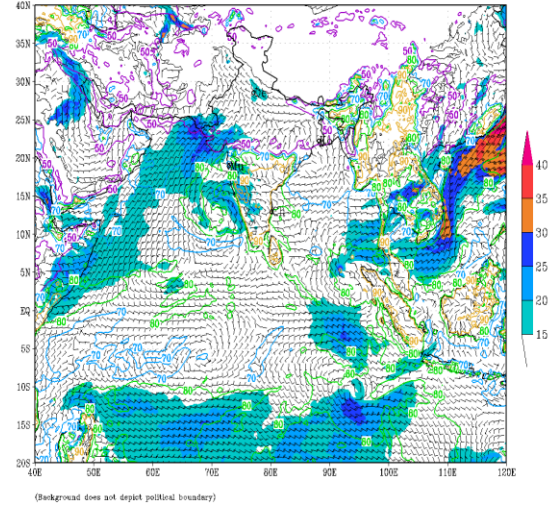


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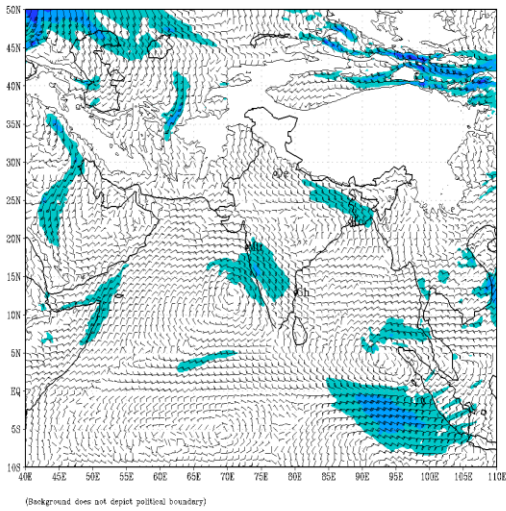
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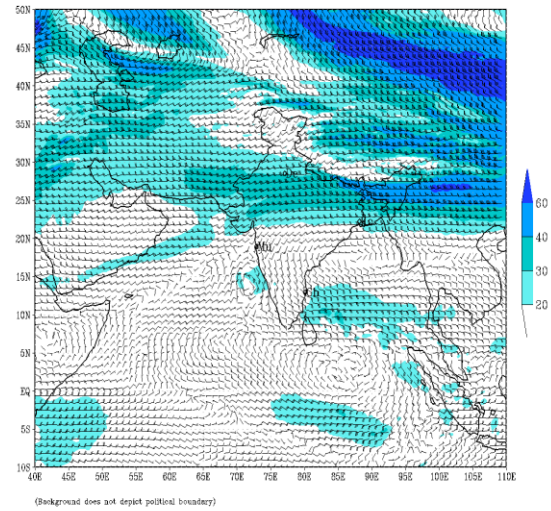
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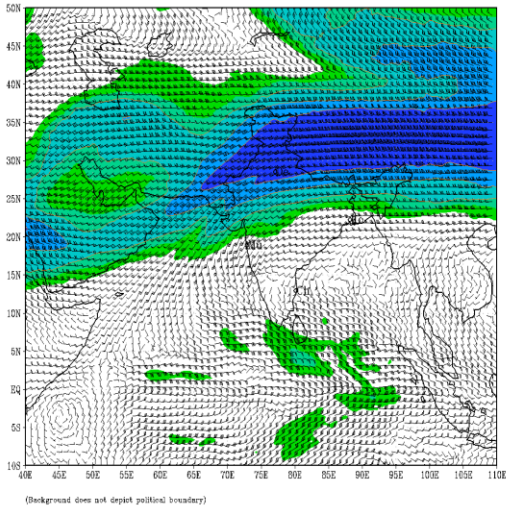
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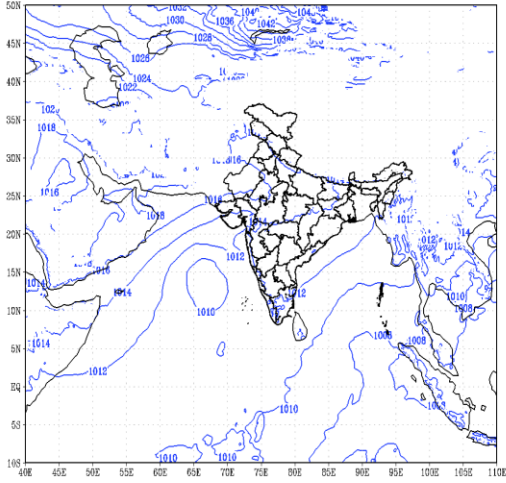
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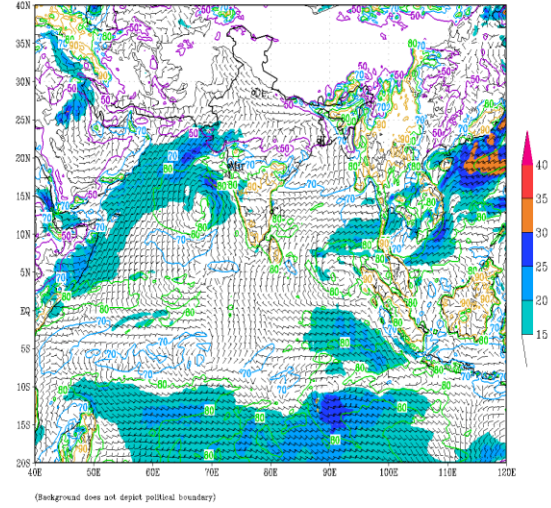
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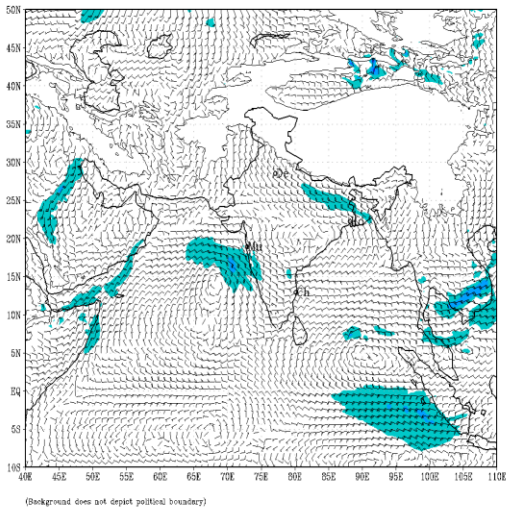
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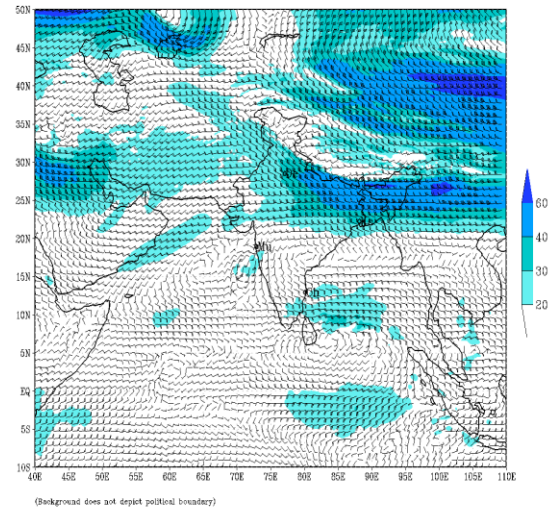
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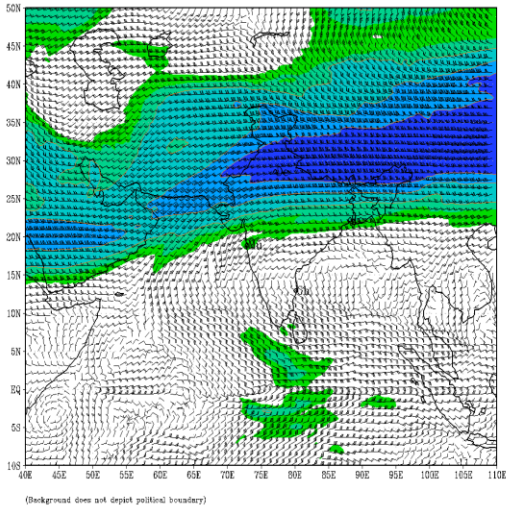
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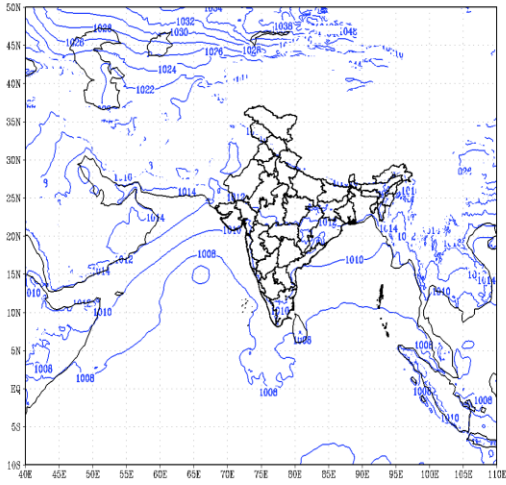
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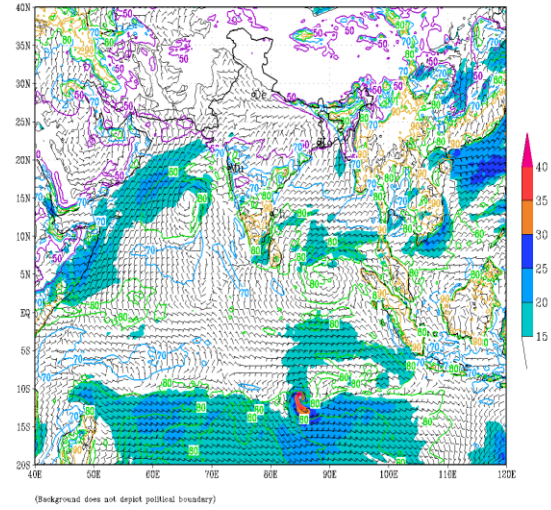
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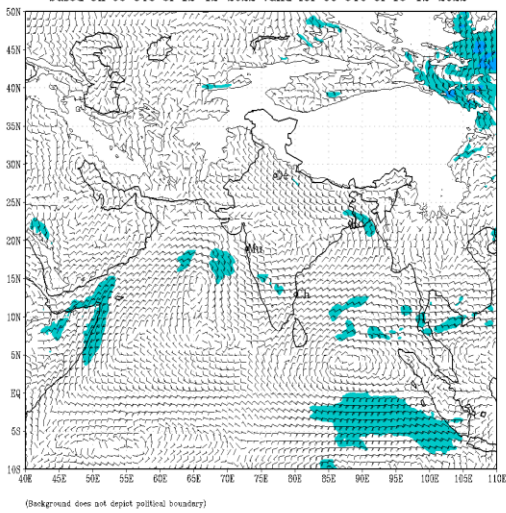
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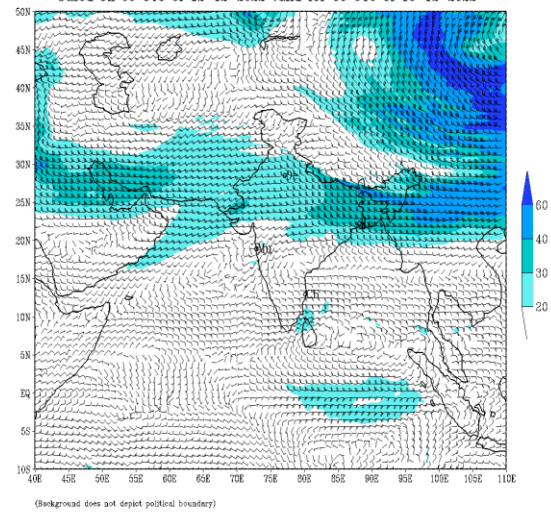
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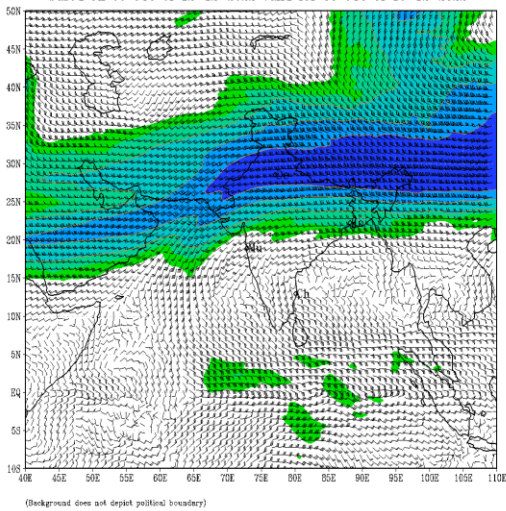
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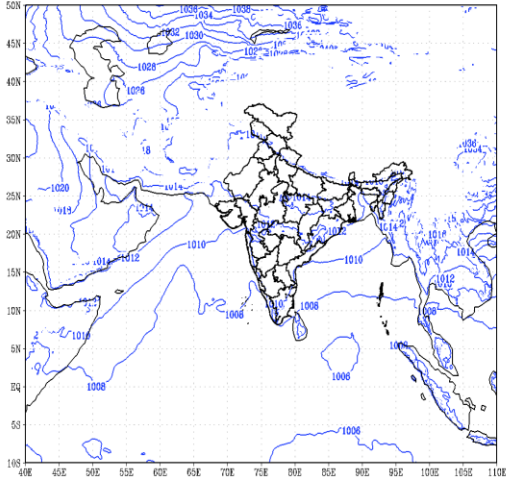
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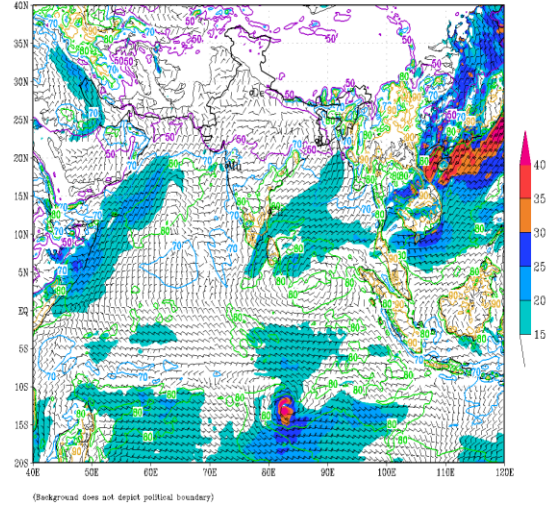
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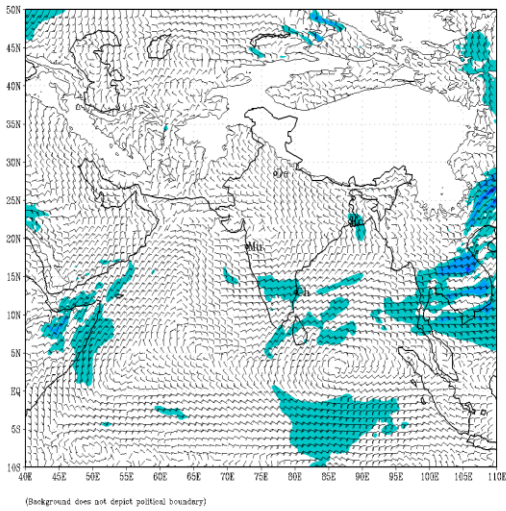
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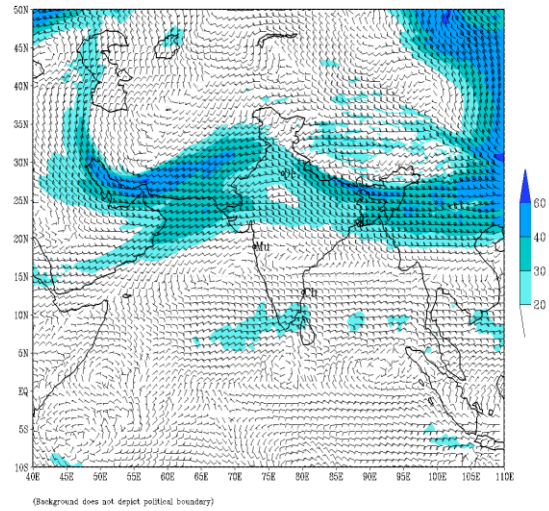
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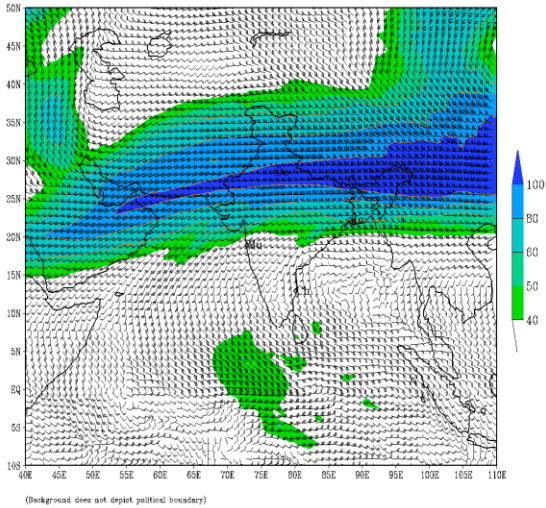
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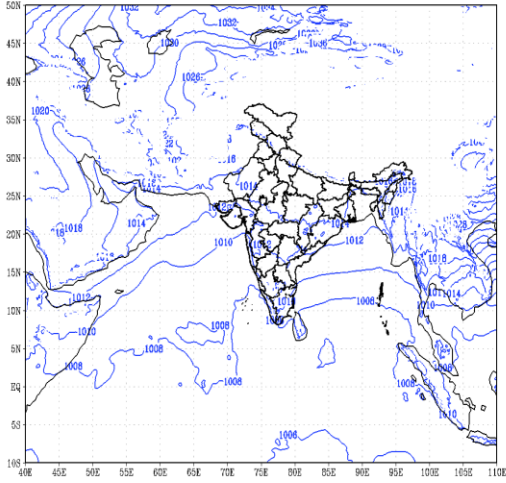
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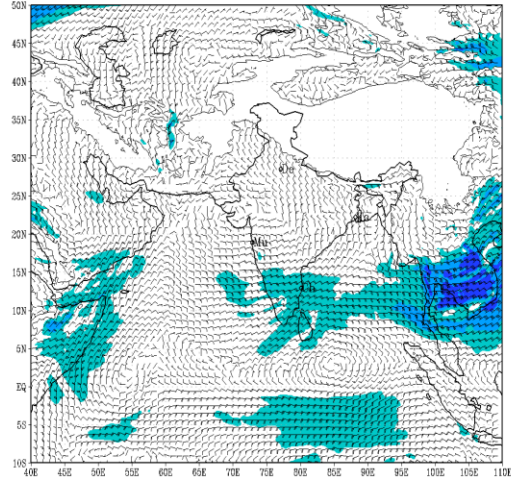


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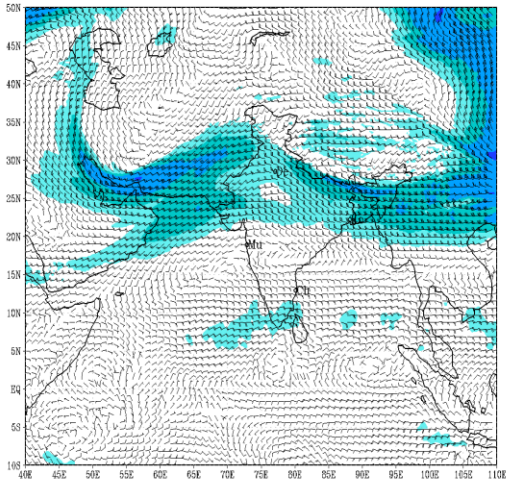
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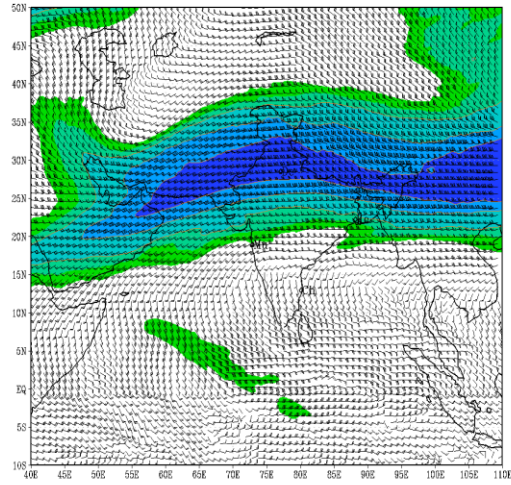
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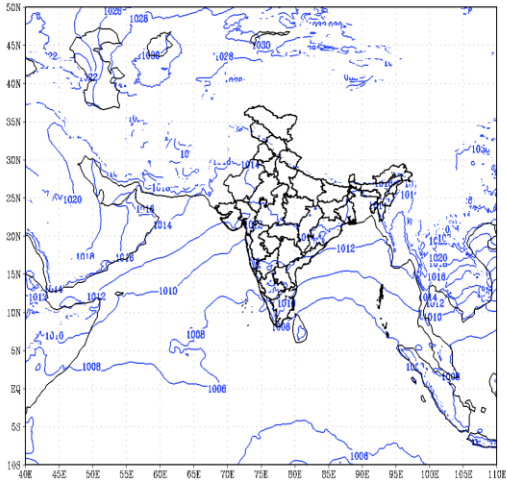
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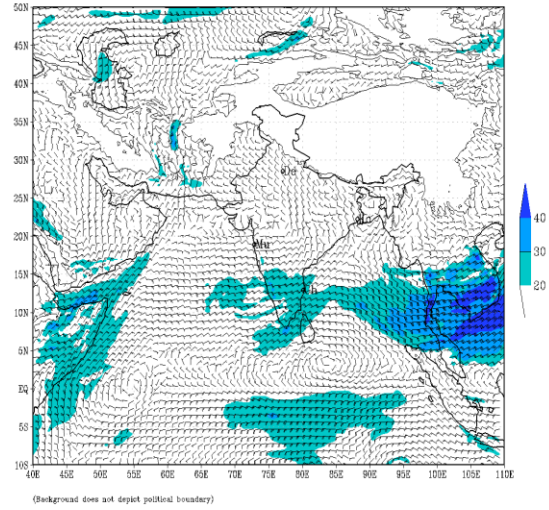


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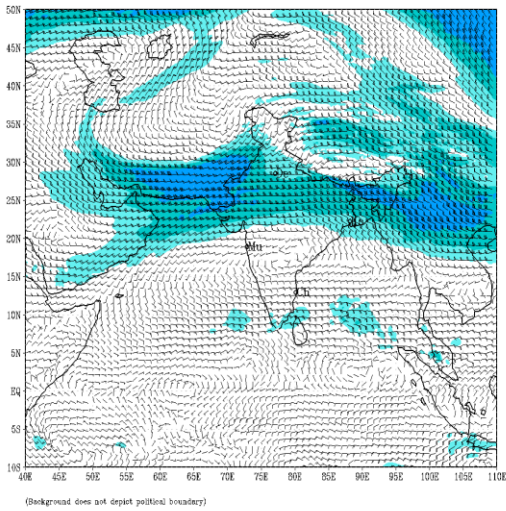
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based on 00 UTC of 12-12-2022 valid for 00 UTC of 19-12-2022



IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 12-12-2022 valid for 00 UTC of 19-12-2022



IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 12-12-2022 valid for 00 UTC of 19-12-2022

