



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

**Tropical Cyclone Forecast Programme
Report Dated 16th December 2022**

Time of Issue: 1200 UTC

Synoptic features (based on 0600 UTC analysis):

Deep Depression over Eastcentral & adjoining Westcentral Arabian Sea moved westsouthwestwards with a speed of 14 kmph during past 06 hours and lay centered at 1130 hrs IST of today, the 16th December 2022 over the same region near latitude 13.8N and longitude 64.4E about 950 km west-northwest of Aminidivi (Lakshadweep), 1030 km west-southwest of Panjim (Goa) and 1160 km east-southeast of Salalah (Oman). It is very likely to move west-southwestwards and weaken gradually into a Depression around today evening and further into a well marked low pressure area by 17th December evening.

The Low Pressure Area over Southeast Bay of Bengal & adjoining East Equatorial Indian Ocean persists over the same region. It is likely to move westwards and maintain its intensity over South Bay of Bengal till morning of 17th December 2022.

Dynamical and thermo-dynamical features

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) °C	28-30 over entire BoB except southern parts of southwest BoB and Gulf of Mannar where the same is 26-28.	28-30 around the system and over eastcentral and southeast and adjoining southwest AS, 26-27 over westcentral and southwest AS.
Tropical Cyclone Heat Potential (TCHP) kJ/cm²	90-100 over eastcentral BoB, 90-100 over south Andaman Sea, southeast BoB adjoining EIO. 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)	30-50 over southeast and adjoining EIO.	50-100 around the system center and 25 along the forecasted track.
Low Level convergence (X10⁻⁵ s⁻¹)	5-10 over southeast BoB and adjoining EIO and adjoining southwest BoB.	5-10 to around the system center.
Upper Level divergence (X10⁻⁵ s⁻¹)	5-10 over southeast BoB and adjoining EIO.	10-20 around system center. 5 along the forecasted path.
Vertical Wind Shear (VWS knots)	20-25 over south BoB and 10 over the Andaman Sea.	10 -15 around system center. 20-25 along the forecasted path.

Wind Shear Tendency (knots)	Decreasing over southeast BoB and adjoining EIO and over eastcentral BoB.	Decreasing around system.
Upper tropospheric Ridge	Along 15.0°N over the BoB.	Along 15.0°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 southeast Bay of Bengal adjoining equatorial Indian Ocean and south andaman sea. Sct low/med clouds with embdd mod to int convtn over southwest BoB and north Andaman Sea.

b) Over the Arabian Sea: -

Vortex (dd) over eastcentral AS & adjoining westcentral and neighbourhood lay centered within half a degree of 13.7N / 64.6E. Intensity T2.0/2.0. Associated Scattered to broken low and medium clouds with embedded intense to very intense convection lay over eastcentral Arabian sea between lat 13.2N to 16.7E long 64.50E to 68.5E. Minimum Cloud Top Temperature is -81 degree Celsius.

M.J.O. Index:

The Madden Julian Oscillation (MJO) Index is currently in Phase 2 with amplitude less than 1. It will remain in same phase for next three days with increasing in amplitude. Thereafter, it will move to phase 3.

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 low pressure area (LPA) over southeast BoB and adjoining EIO as on today will move westwards and will become less marked by 17 th Dec.	The deep depression (DD) over Eastcentral & adjoining Westcentral Arabian Sea as of today will move west-southwestwards and lay as depredssion (D) over westcentral and adjoining southwest Arabian Sea by evening of today, will become less marked 17 th Dec evening.
IMD-GEFS	The low pressure area (LPA) over southeast BoB and adjoining EIO as on today will move westwards and will become less marked by 17 th Dec.	The deep depression (DD) over Eastcentral & adjoining Westcentral Arabian Sea as of today will move west-southwestwards and lay as depredssion (D) over westcentral and adjoining southwest Arabian Sea by evening of today, will become less marked 17 th Dec evening.
GEFS Probabilistic guidance	-	-

IMD WRF	No significant system.	The deep depression (DD) over Eastcentral & adjoining Westcentral Arabian Sea as of today will move west-southwestwards and lay as depression (D) over westcentral and adjoining southwest Arabian Sea by evening of today, low pressure area (LPA) over westcentral and adjoining southwest Arabian Sea by morning of 17 th Dec, will become less marked thereafter.
NCMRWF-NCUM	The cycir over southeast BoB and adjoining EIO as on today will have its westward direction towards Sri Lanka coast.	The depression (D) over eastcentral and adjoining Westcentral Arabian Sea as of today will move west-southwestwards and lay over westcentral and adjoining southwest Arabian Sea as LPA by 17 th morning, will move in same direction and lay as LPA over westcentral and adjoining southwest AS, it will become less marked thereafter.
NCMRWF-NEPS	The cycir over southeast BoB and adjoining EIO as on today will have its westward direction towards Sri Lanka coast without further intensification.	The depression (D) over westcentral and adjoining southwest Arabian Sea by evening of today's evening, will move west-southwestwards and lay as D over westcentral and adjoining southwest AS by 17 th morning, over westcentral and adjoining southwest Arabian Sea as LPA by 18 th morning, it will become less marked thereafter.
NCMRWF-UM (Regional)	No significant system.	The depression (D) over westcentral and adjoining southwest Arabian Sea by evening of today's evening, will move in west-southwestwards.
ECMWF	The cycir over southeast BoB and adjoining EIO as on today will have its westward direction towards Sri Lanka coast without further intensification.	The deep depression (DD) over eastcentral and adjoining westcentral Arabian Sea as of today will move west-southwestwards and lay over westcentral and adjoining southwest Arabian Sea as D by today evening, it will maintain as D till 17 th evening and will weaken gradually thereafter.
ECMWF ensemble	60-70% probability for a fresh LPA over southeast BoB to track west-northwestwards.	High probability of depression over central Arabian Sea during 15 th -18 th with west-northwestwards movement.
NCEP-GFS	The LPA over southeast BoB and adjoining EIO as on today will move westwards towards Sri Lanka coast without further intensification.	A low pressure area (LPA) over westcentral and adjoining southwest Arabian Sea as on today will have west-southwestwards movement with further weakening.
IMD MME	No guidance	Depression over westcentral and adjoining eastcentral Arabian Sea as on today's evening, will move in westward direction with further weakening.
IMD HWRF	No guidance	No guidance
IMD-Genesis Potential Parameter	A potential zone over southeast and adjoining and adjoining EIO on 19 th Dec will move westwards towards Sri Lanka coast.	A potential zone over eastcentral and adjoining westcentral Arabian Sea as of today will move west-northwestwards till 17 th Dec.

Summary and conclusion:

- ❖ Most of the models captured that the deep depression over eastcentral and adjoining westcentral Arabian Sea as on today the 16th Dec 2022 will move west-southwestwards and weakening into depression over westcentral and adjoining southwest Arabian Sea on evening of

16th Dec 2022. Most of the models are showing its west-southwestward movement with gradual weakening thereafter.

- ❖ Most of the models predicted LPA over southeast BoB and adjoining EIO today and its westward movement towards Sri Lanka coast with same intensity till 17th/18th morning and weaken thereafter.

In view of all the above, it is inferred that

1. For the Bay of Bengal:

The existing low pressure area over southeast Bay of Bengal and adjoining EIO will move nearly westwards. It would maintain its intensity till 17th/18th morning and weaken gradually thereafter while moving towards Sri Lanka coast.

2. For Arabian Sea:

Deep Depression over Eastcentral & adjoining Westcentral Arabian Sea moved westsouthwestwards with a speed of 14 kmph during past 06 hours and lay centered at 1130 hrs IST of today, the 16th December 2022 over the same region near latitude 13.8N and longitude 64.4E about 950 km west-northwest of Aminidivi (Lakshadweep), 1030 km west-southwest of Panjim (Goa) and 1160 km east-southeast of Salalah (Oman). It is very likely to move west-southwestwards and weaken gradually into a Depression around today evening and further into a well marked low pressure area by 17th December evening.

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

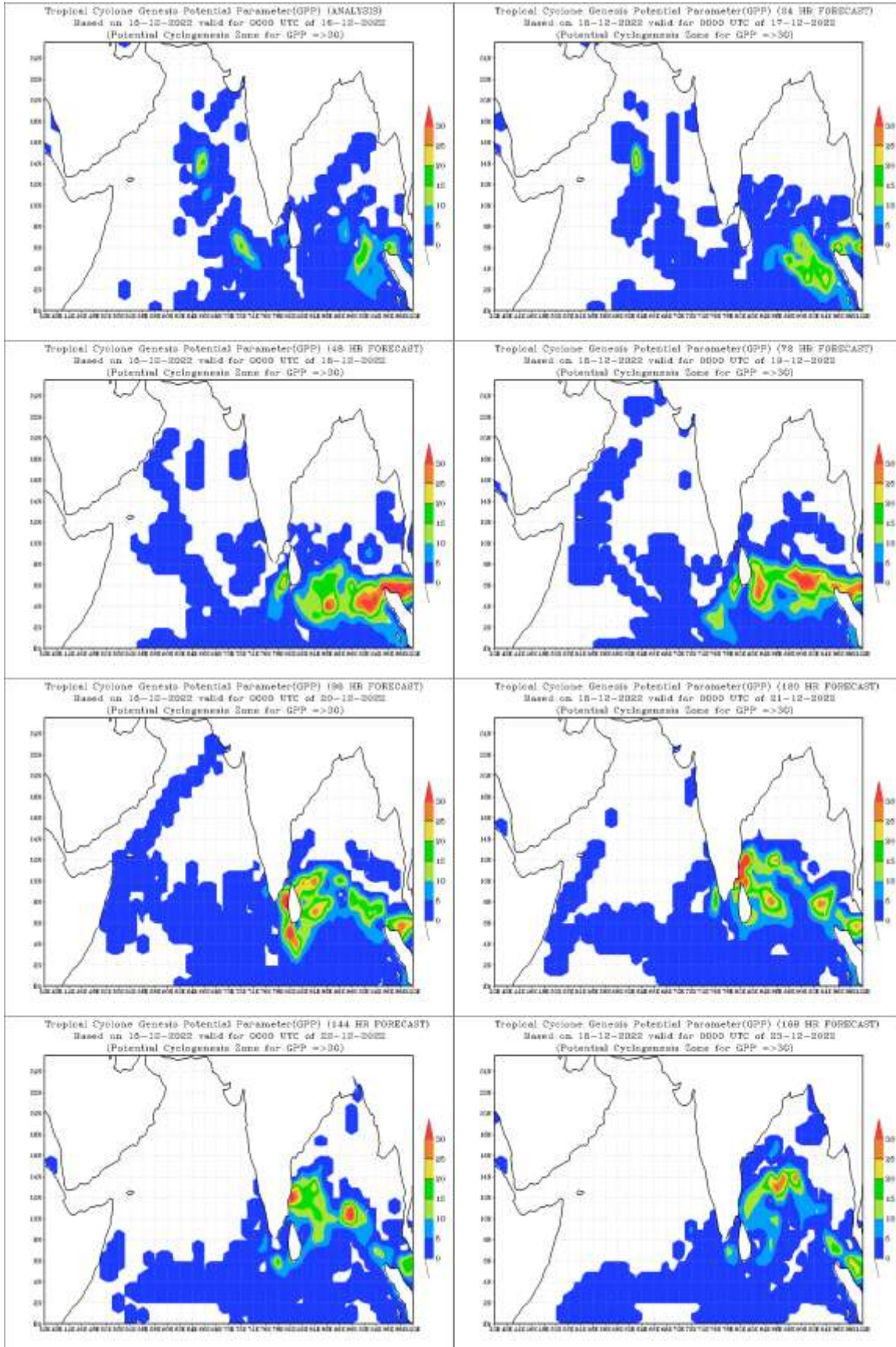
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
Nil	Low	Nil	NIL	NIL	NIL	NIL

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

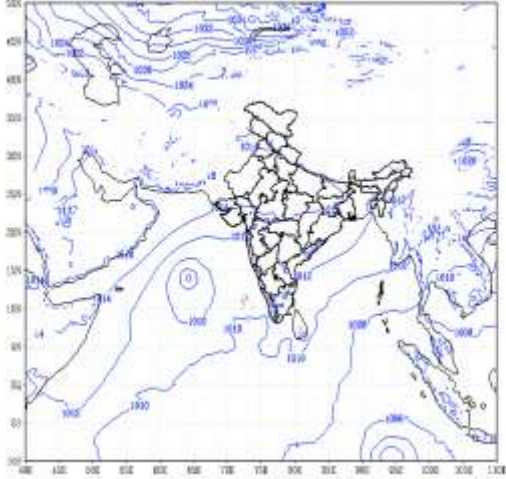
24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
-	-	-	Nil	NIL	NIL	NIL

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

IOP: NIL

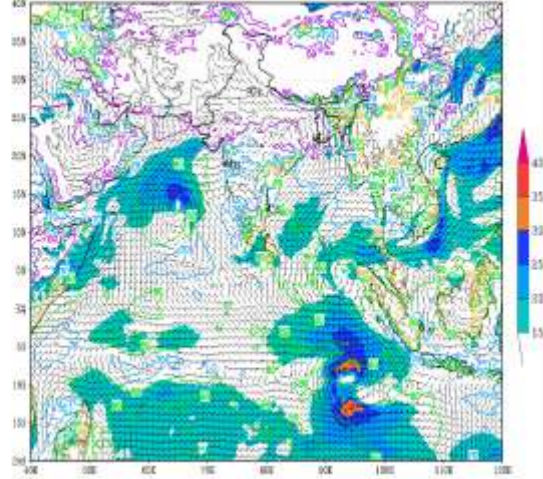


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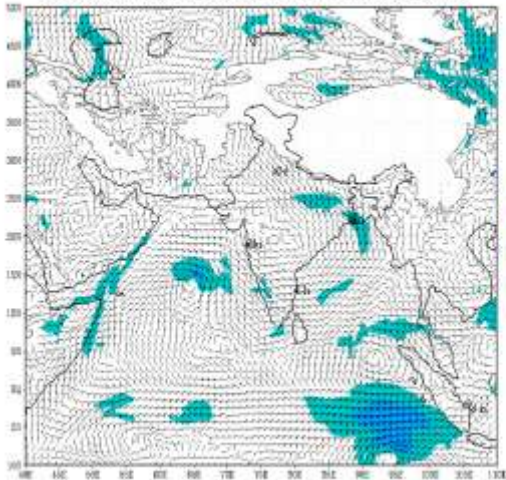
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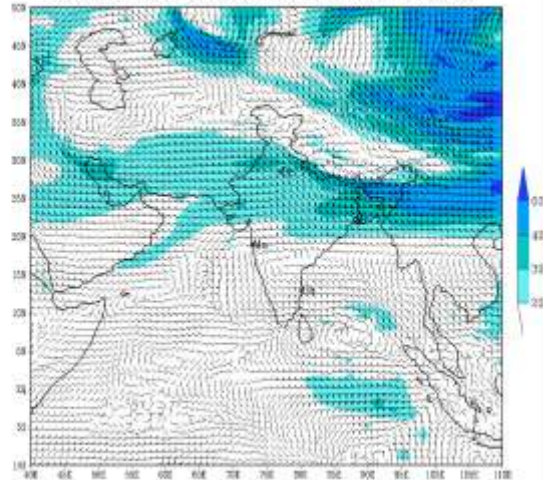
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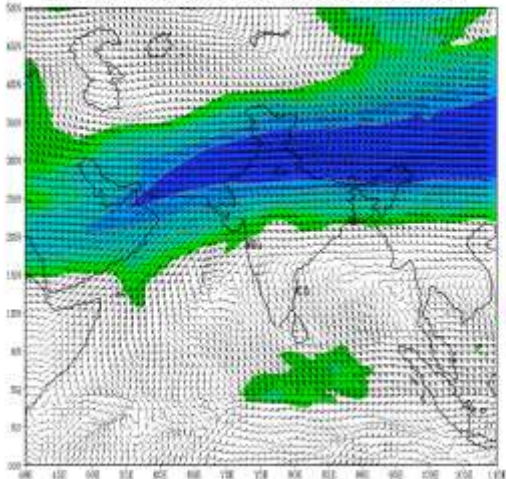
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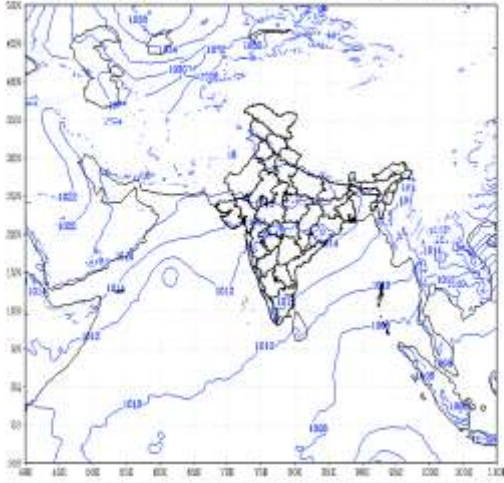
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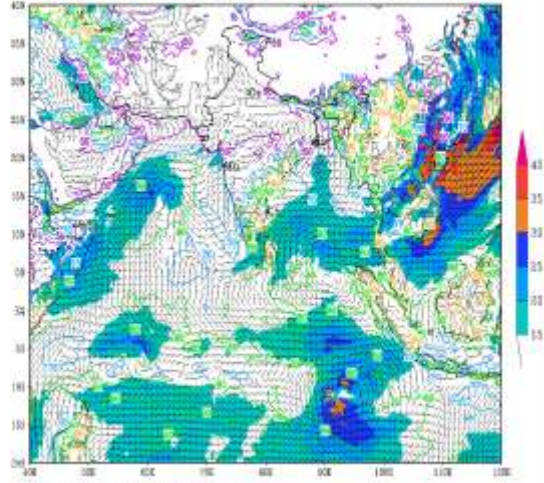
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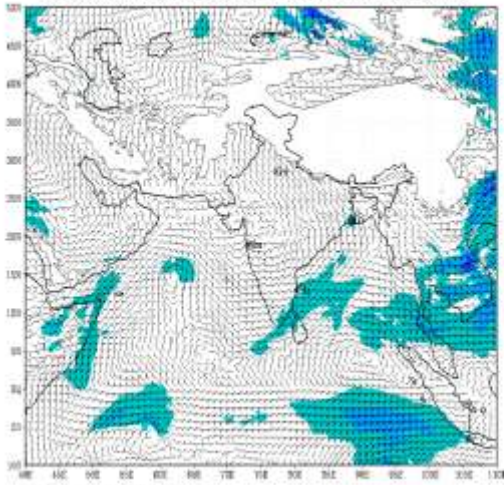
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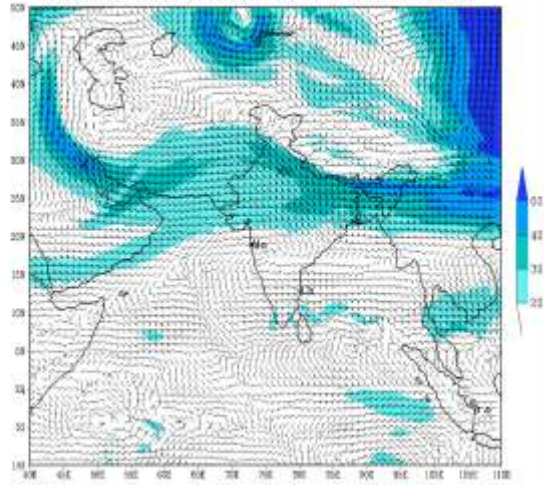
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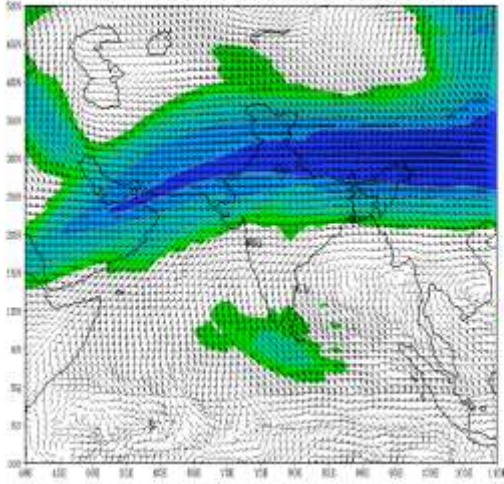
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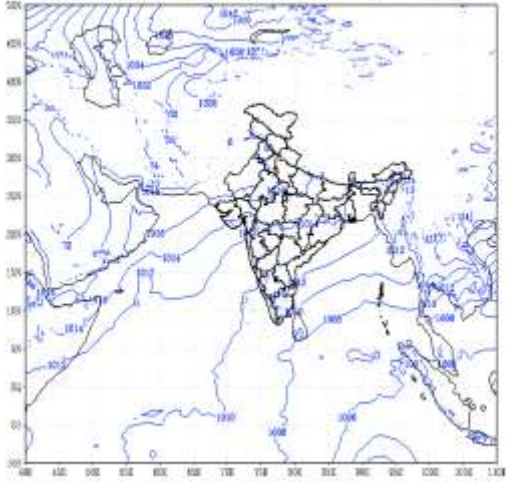
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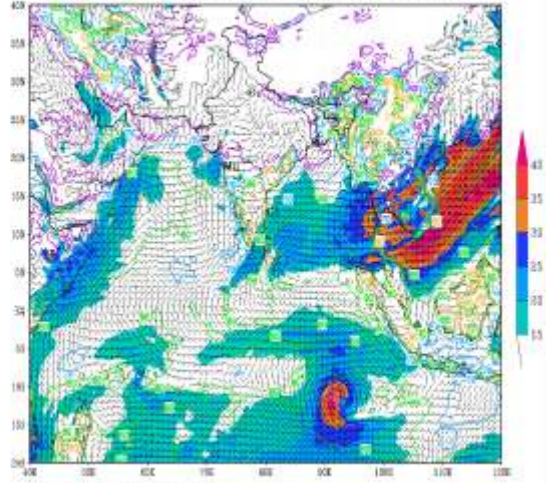
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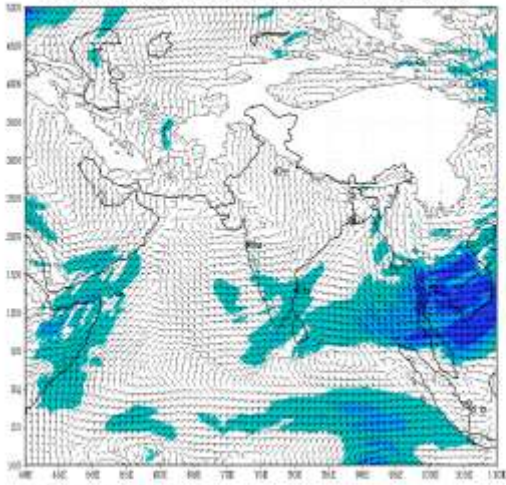
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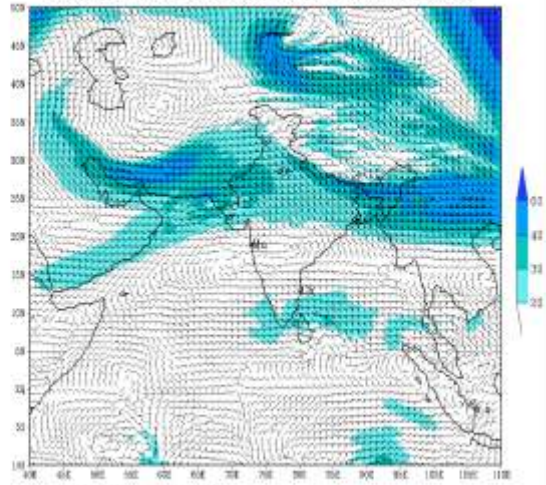
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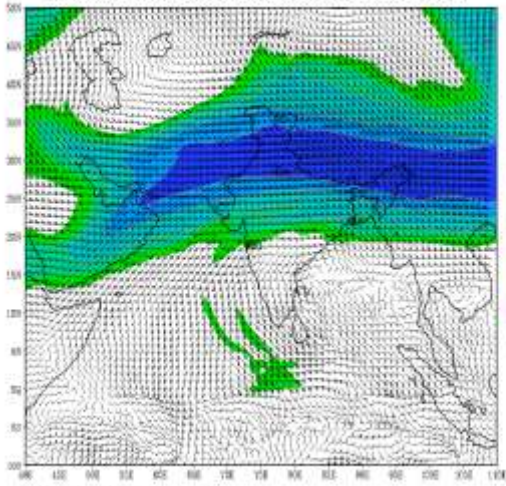
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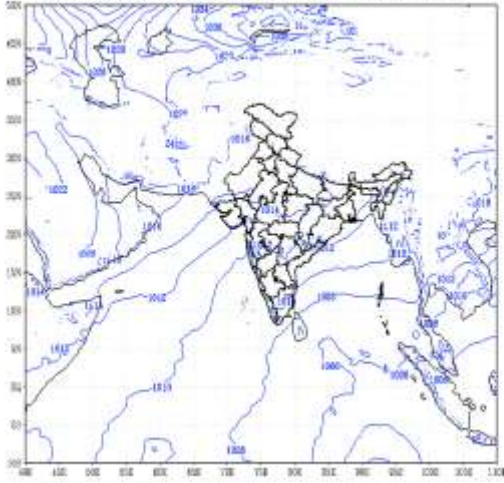
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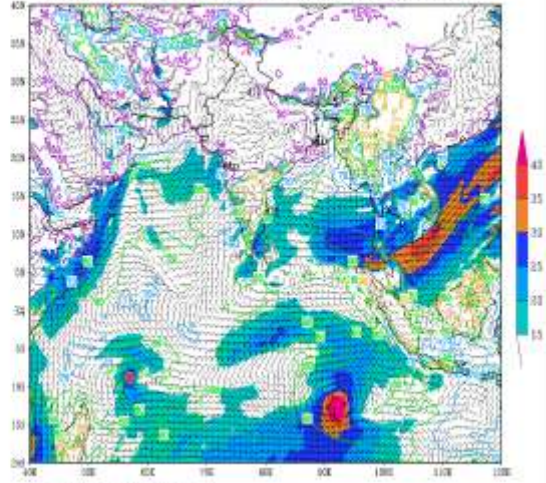
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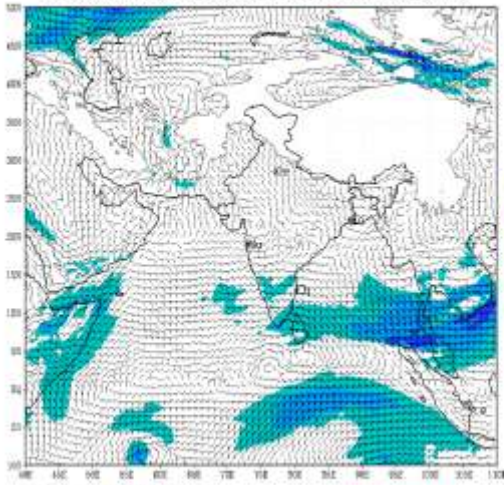
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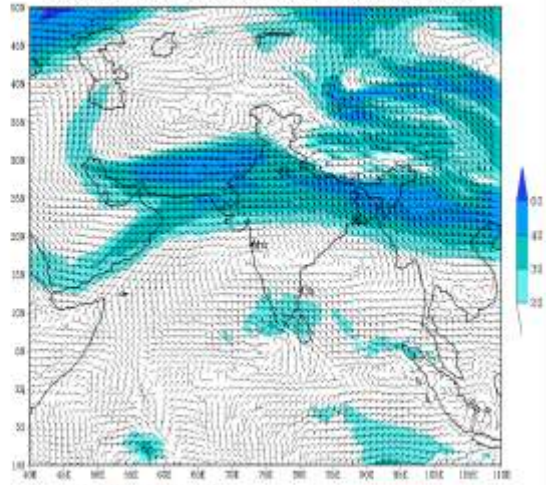
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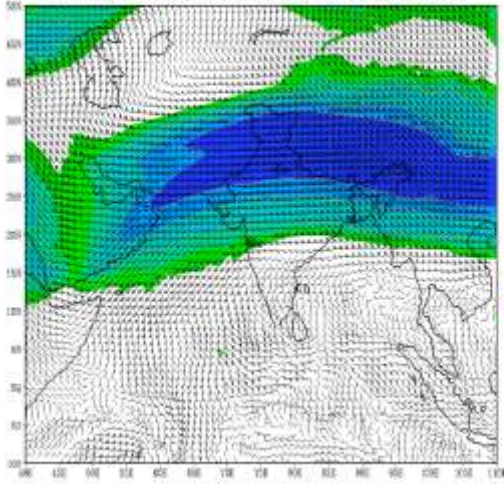
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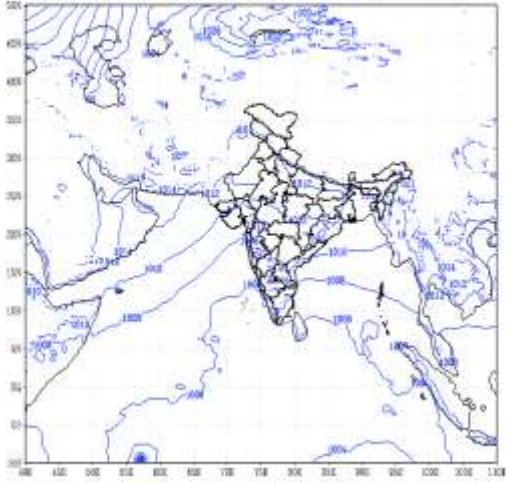
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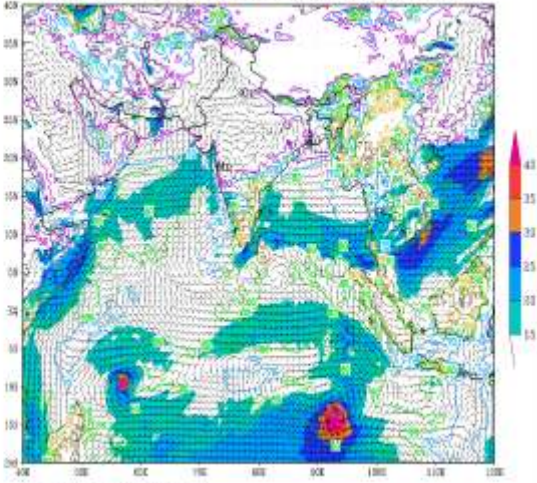
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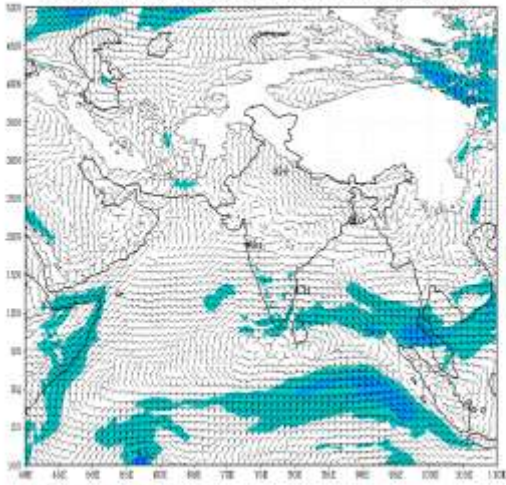
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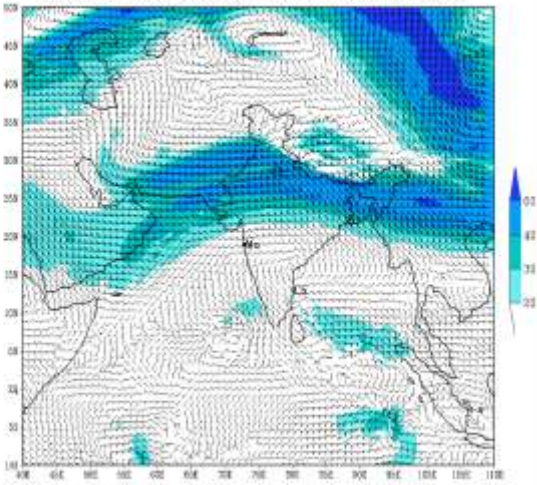
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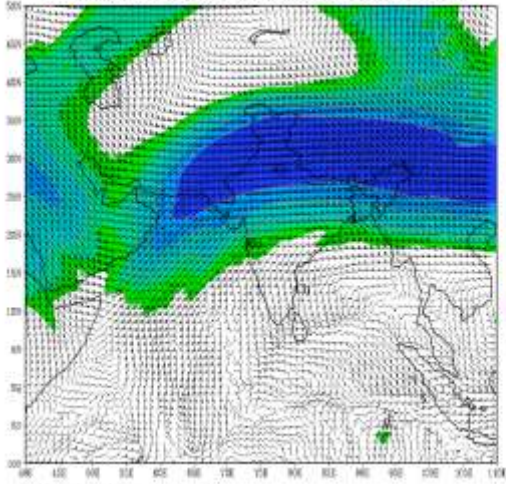
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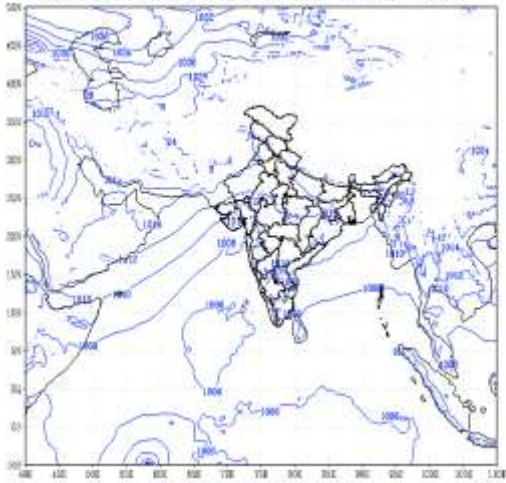
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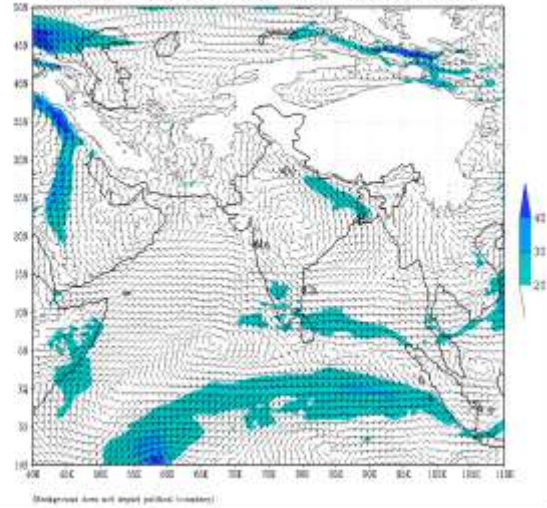
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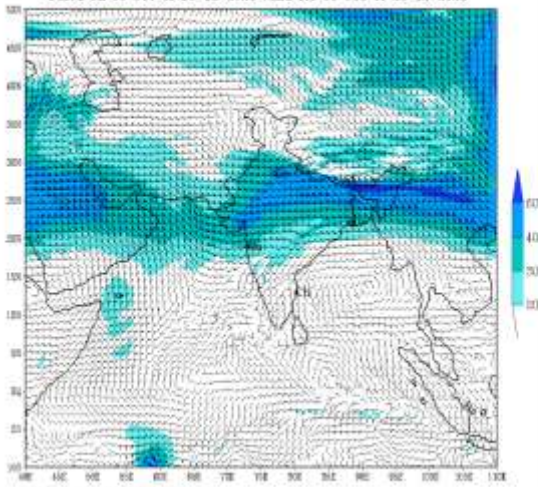
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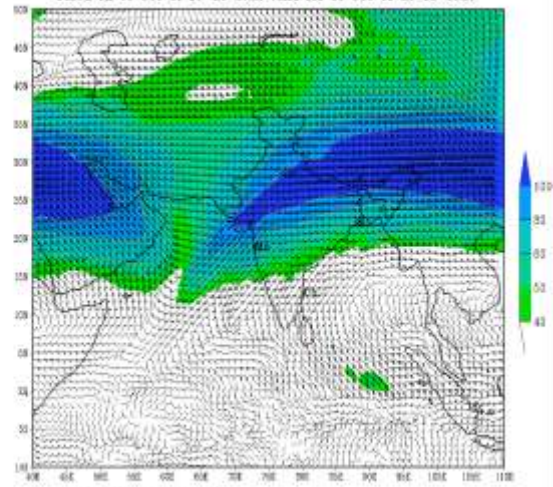
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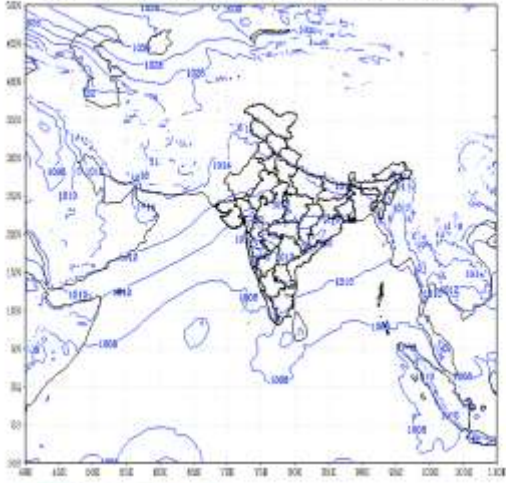
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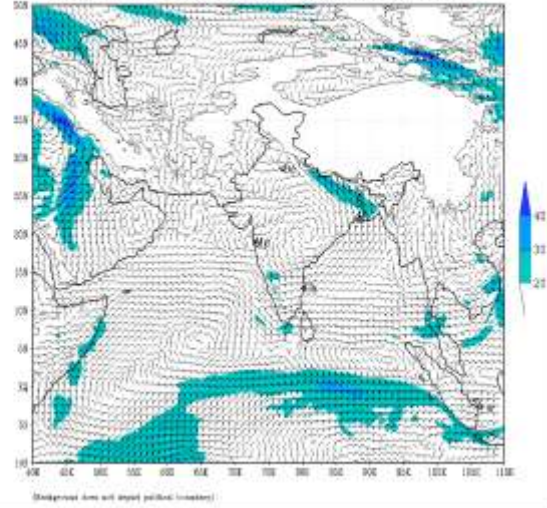


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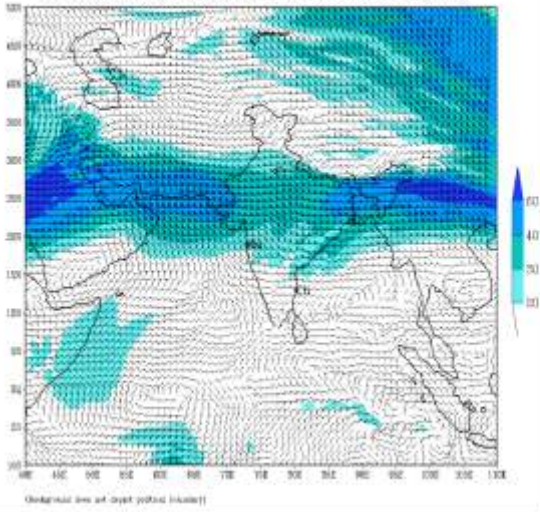
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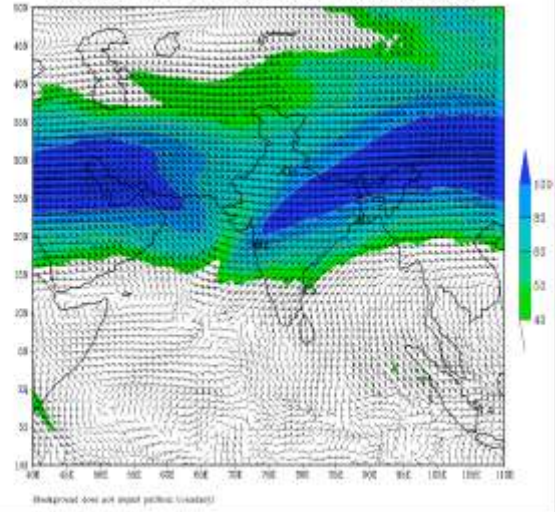
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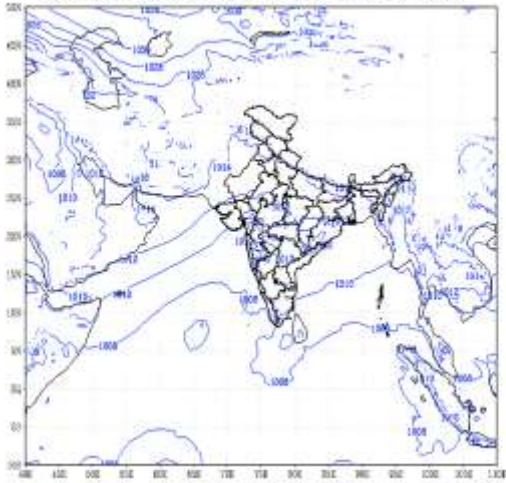
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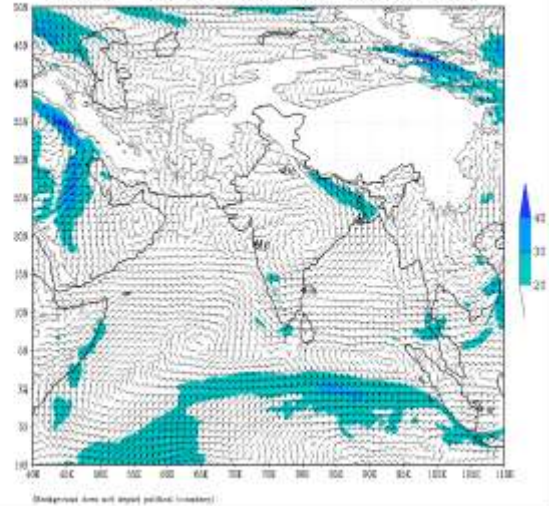


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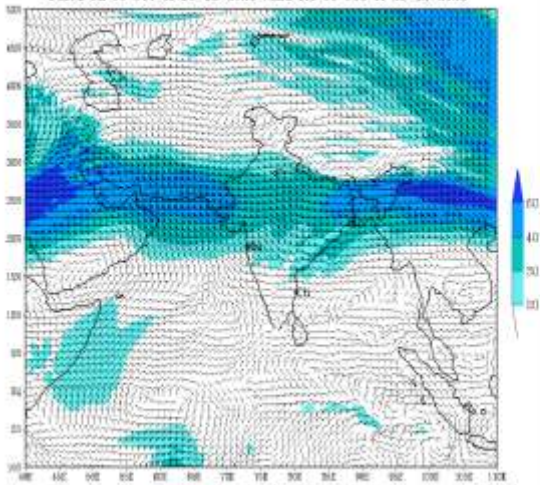
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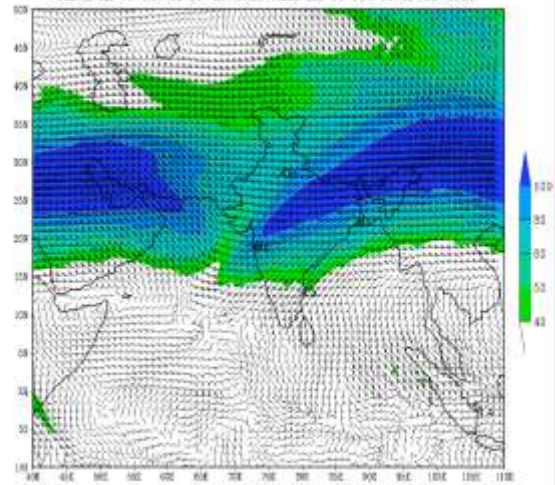
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