



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

FDP (Cyclone) NOC Report Dated 22nd November, 2021

Time of Issue: 1200 UTC

Synoptic features (based on 0900 UTC analysis):

- ❖ Yesterday's well marked low pressure area over eastcentral Arabian Sea (AS) moved gradually west-southwestwards and lay over southeast & adjoining eastcentral AS at 0000 UTC of today, the 22nd November. Moving further west-southwestwards, it lay over westcentral and adjoining southwest AS at 0300 UTC. It persisted over the same region at 0900 UTC of today. It is likely to move further west-southwestwards during next 2 days and weaken gradually thereafter.
- ❖ A trough persists from the cyclonic circulation associated with the Well Marked Low Pressure area over Westcentral & adjoining Southwest Arabian Sea to north Maharashtra coast extending upto 1.5 km above mean sea level.
- ❖ Yesterday's cyclonic circulation over south Andaman Sea & neighbourhood lay over southeast Bay of Bengal (BoB) at 0300 UTC of today, the 22nd November. Vertically, it extended upto 5.8 km above mean sea level. It persisted over the same region at 0900 UTC of today.
- ❖ Another trough persists from the cyclonic circulation over southeast BoB & neighbourhood to Tamilnadu coast extending upto 3.1 km above mean sea level.

Dynamical and thermo-dynamical features

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) °C	29-31°C over entire BoB region.	28-29°C over eastern parts of AS. 26-27°C over western parts of AS off Somalia, Yemen & Oman coasts.
Tropical Cyclone Heat Potential (TCHP) kJ/cm²	(a) 50-60 over southwest BoB, (b) 60-80 over major parts of central & north BoB (c) 100-120 over eastern equatorial Indian Ocean and adjoining south Andaman Sea & southeast BoB.	(a) 50-60 over eastern parts of central & north AS (b) 60-80 over south AS. (c) It is less than 50 over western parts of AS.
Cyclonic Relative vorticity (X10⁻⁶s⁻¹)	40-50 over southwest BoB with vertical extension upto 500 hPa level.	100 over to the southwest of vortex with vertical extension upto 500 hPa level and oriented northeast to southwest. 30-40 over Comorin area.
Low Level convergence (X10⁻⁶)	05-10 over southwest BoB	Small zone of 05 over eastcentral AS to the north of vortex. Another

5 s^{-1})		zone of 05 over southwest AS to the southwest of system centre. Another zone of 05 over southeast AS off Kerala coast.
Upper Level divergence ($\times 10^{-5} \text{ s}^{-1}$)	30 over southwest BoB.	A large extended zone 20 to the southwest of vortex.
Vertical Wind Shear (VWS knots)	Moderate (15-20) over major parts of BoB and Andaman Sea. High to the south of 6°N .	Moderate (15-20 kt) over the vortex area and also along the expected track over southwest and adjoining eastcentral AS.
Wind Shear Tendency (knots)	Decreasing over major parts of south BoB and Andaman Sea.	Decreasing over the vortex area and also along the expected track of system.
Upper tropospheric Ridge	Along 19.5°N .	Along 18.0°N .

Satellite observations based on INSAT imagery (0600 UTC):

(a) Associated with well marked low pressure area over eastcentral Arabian Sea

At 0900 UTC, the vortex over westcentral and adjoining southwest AS is characterized with intensity of T 1.0 and is centred near 13.1N and 64.8E . Scattered low & medium clouds with embedded intense to very intense convection lay over southwest & adjoining westcentral AS between latitude 10.0N & 15.0N and longitude 60.0E & 65.0E . Minimum cloud top temperature is minus 88°C at 0900 UTC.

(b) Associated with convection over central parts of south Bay of Bengal

At 0900 UTC, convection persisted over southwest BoB and neighbourhood during last 6 hours. Minimum cloud top temperature is minus 84°C at 0900 UTC.

(c) Associated with convection over Bay of Bengal

At 0900 UTC, scattered to broken low & medium clouds with embedded intense to very intense convection lay over southwest & adjoining southeast BoB. Scattered to broken low & medium clouds with embedded isolated weak to moderate convection lay over rest southeast BoB and Andaman Sea.

(d) Associated with convection over Arabian Sea

At 0900 UTC, scattered low & medium clouds with embedded intense to very intense convection lay over westcentral & adjoining southwest AS between latitude 9.0N & 19.0N and longitude 55.0E & 68.0E .

M.J.O. Index:

MJO index is currently in Phase 4 with amplitude close to 1. It will move in phase 3 and 4 with amplitude close to 1 during next next 7 days.

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

Tropical Storm "PADDY" is located near $13.3^{\circ}\text{S}/108.2^{\circ}\text{E}$ with associated maximum sustained wind speed of 35 kts.

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

Model	BoB	AS
IMD-GFS	No cyclogenesis is indicated over the BoB region during next 7 days. However, IMD GFS is indicating an LPA over southeast BoB on 22^{nd} with gradual westwards movement towards southwest BoB off sriLanka coast till 25^{th} . Thereafter, extended low is seen	Indicates a well marked low pressure area over central parts of AS with west-southwestwards movement becoming less marked on 25^{th} over southwest AS. Fresh extended low pressure area is

	over southwest BoB and adjoining north SriLanka & TamilNadu during 26 th to 28 th .	seen over southeast AS on 29 th .
IMD-GEFS	AN LPA over southwest BoB on 22 nd with gradual westwards movement towards southwest BoB off Sri lanka coast till 25 th . Seen as an extended low pressure area over southwest BoB and adjoining Sri lanka and TamilNadu during 26 th to 27 th .	It is indicating LPA over westcentral AS on 22 nd becoming less marked on 23 rd .
IMD-WRF	An LPA over southeast BoB on 22 nd , becoming less marked on 23 rd & 24 th and again seen as an LPA over southwest BoB off Sri lanka coast on 25 th .	Indicates a WML over eastcentral AS on 22 nd , LPA over westcentral AS on 23 rd , becoming less marked on 24 th .
NCMRWF-NCUM	A cyclonic circulation over southeast BoB and adjoining on 22 nd moving west-northwestwards towards Sri Lanka till 25 th . Thereafter weak circulation persisting over southwest BoB and adjoining SriLanka and southern Peninsular region during 26 th to 29 th .	Indicates a WML over westcentral AS on 22 nd with west southwestwards movement towards southwest AS till 24 th and becoming less marked thereafter.
NCMRWF-NEPS	Indicating extended low pressure area over southwest BoB moving gradually westwards towards southwest BoB off Sri Lanka till 26 th .	Indicating similar trends in movement of system as other models. However, this model is also indicating slight intensification during 23 rd to 25 th over southwest AS. Further, it is also indicating system to reach Somalia coast on 26 th as an LPA. Becoming less marked thereafter.
NCMRWF-UM (Regional)	Extended low pressure area over southwest BoB and adjoining Sri Lanka and southern Peninsular region during 24 th to 27 th .	Indicates a WML over eastcentral AS on 22 nd with west southwestwards movement towards westcentral AS till 23 rd and becoming less marked thereafter.
ECMWF	Indicates Cyclonic Circulation/LPA over southeast BoB on 22 nd , southwest BoB on 23 rd , close to Sri Lanka on 24 th with overall west-northwestwards movement.	Indicates WML over east-central AS on 22 nd with west-southwestward movement and gradual weakening from 23 rd onwards becoming insignificant on 26 th .
ECMWF-EPS	70-80 % probability of cyclogenesis over southwest BoB during 25 th to 27 th .	70-80 % probability of cyclogenesis over westcentral and adjoining southwest BoB during 22 nd to 25 th
NCEP-GFS	No significant cyclogenesis zone over BoB	Similar trends as IMD GFS.
IMD-GPP	A feeble potential zone over southwest BoB off Tamil Nadu coast on 27 th & 28 th .	No significant potential zone for cyclogenesis over AS during next 7 days.

GPP- Genesis Potential Parameter based on Dynamical Statistical model developed by IMD.

Summary and Conclusion:

- 1. For the Bay of Bengal:** Majority of the models indicate no cyclogenesis during next seven days. However, most of the models are indicating development of low pressure area over southeast BoB from 22nd onwards with subsequent west-northwestwards movement towards North SriLanka coast and no significant intensification.
- 2. For the Arabian Sea:** Most of models indicate that the well marked low pressure area would move west-southwestwards for next 2 days towards southwest AS and become less marked thereafter.

It may thus be concluded that,

- No cyclogenesis is expected over the BoB and AS region during next 7 days.
- The Well Marked Low Pressure Area over westcentral and adjoining southwest Arabian Sea would move west-southwestwards for next 2 days and weaken gradually. The movement and intensification of the system is being continuously monitored.
- The movement and intensification of cyclonic circulation over southeast BoB is being monitored.

Probability of cyclogenesis (formation of depression and above intensity systems) over the Bay 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

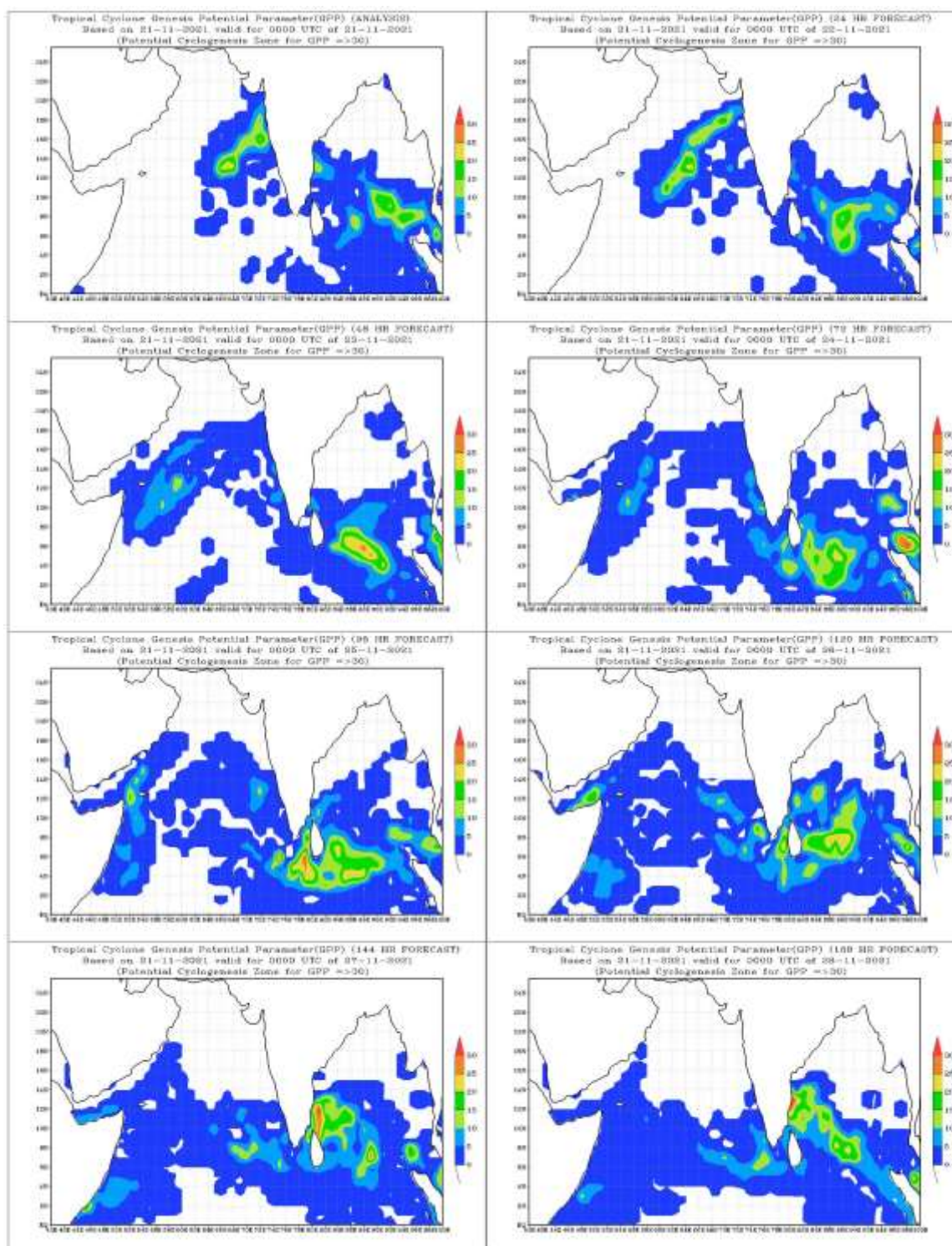
Probability of cyclogenesis (formation of depression and above intensity systems) over the Arabian Sea during next 168 hours:

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

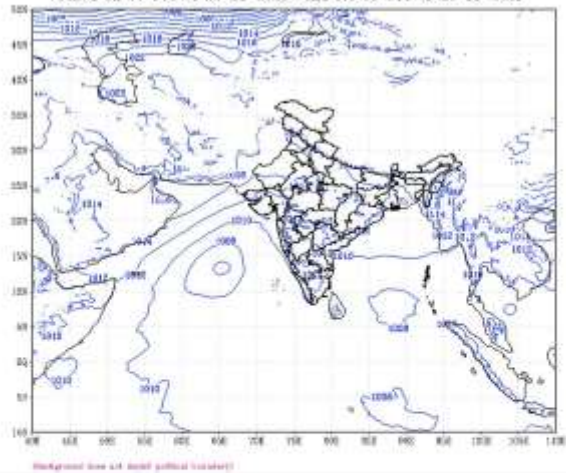
Advisory:

- The Well Marked Low Pressure Area over westcentral and adjoining southwest Arabian Sea would move west-southwestwards for next 2 days and weaken gradually. Continuous monitoring of the movement and intensification of the system required.
- Continuous monitoring of the movement and intensification of cyclonic circulation over southeast BoB is required.

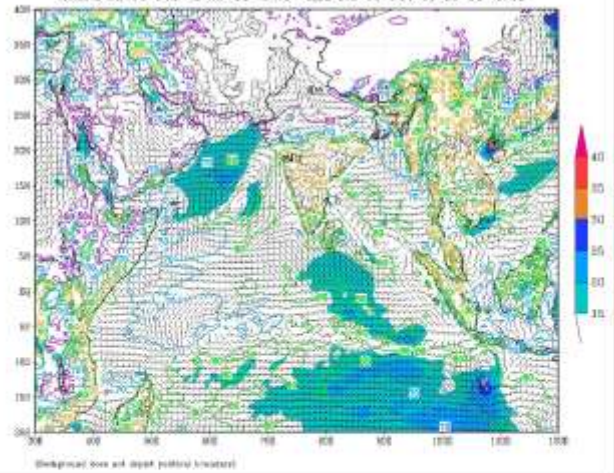
No IOP is suggested for next 24 hours.



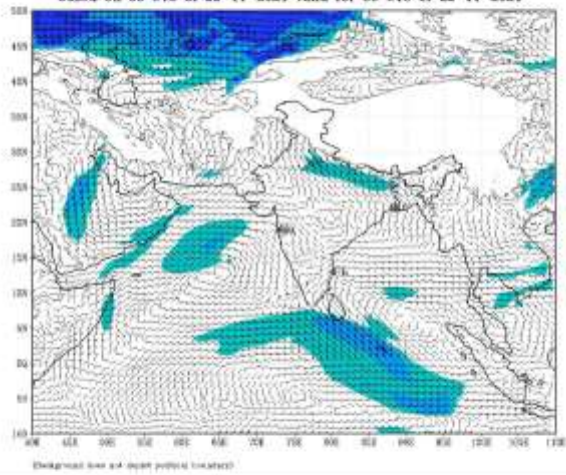
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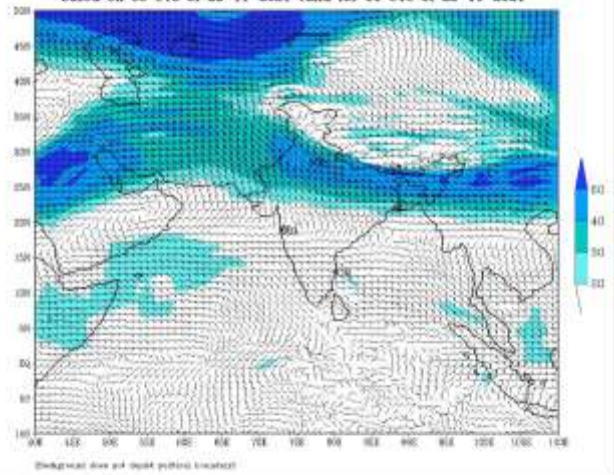
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)
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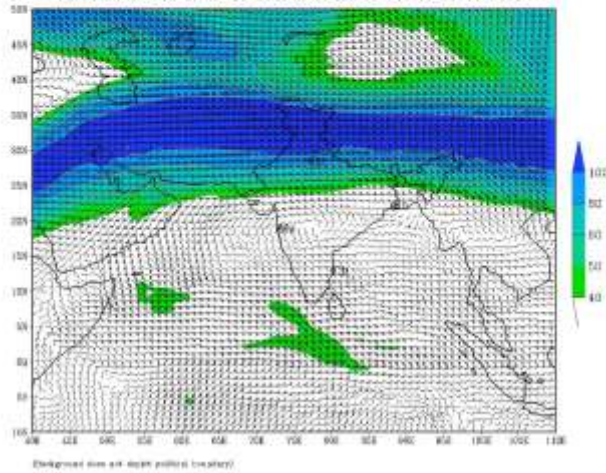
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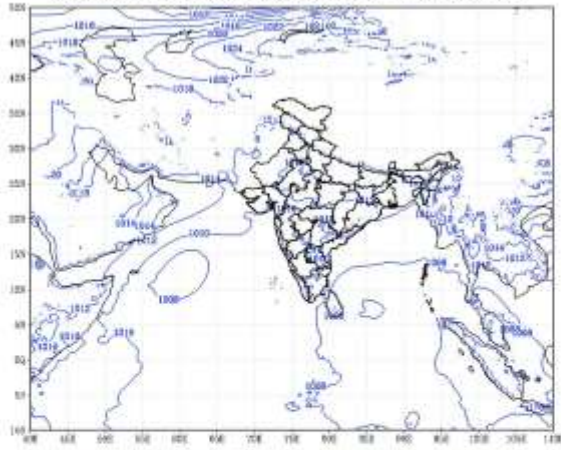
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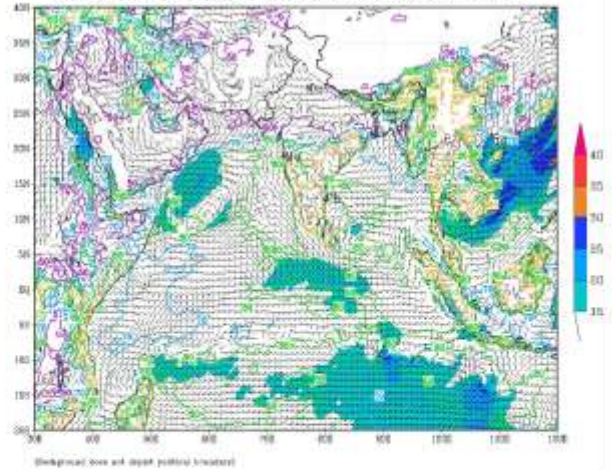
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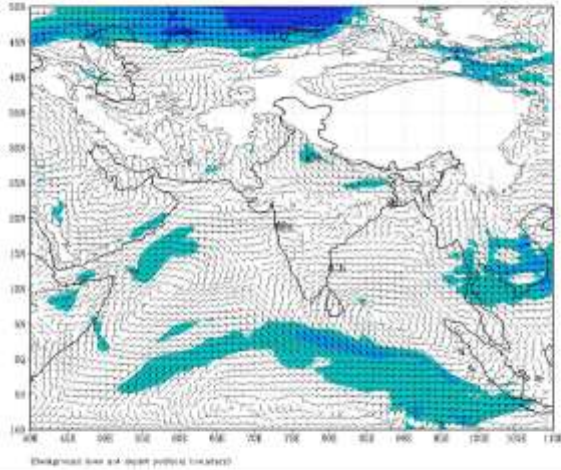
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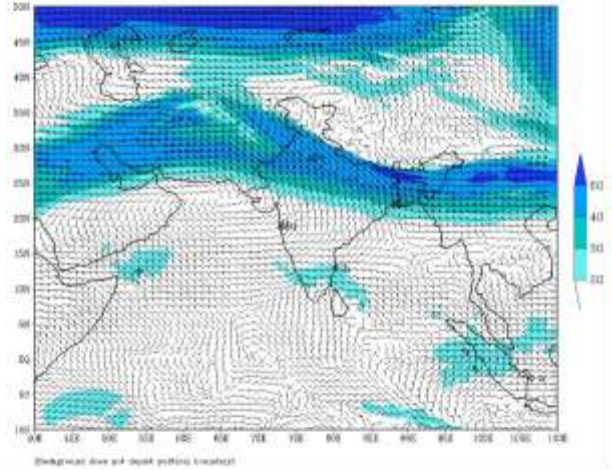
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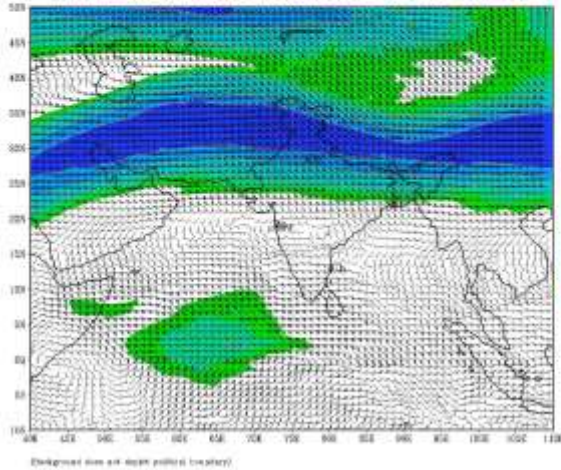
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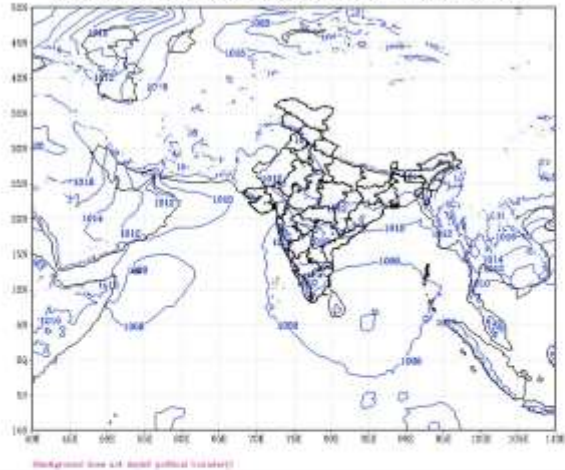
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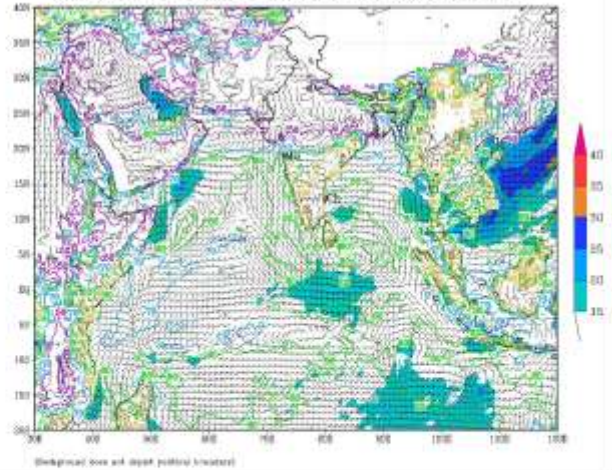
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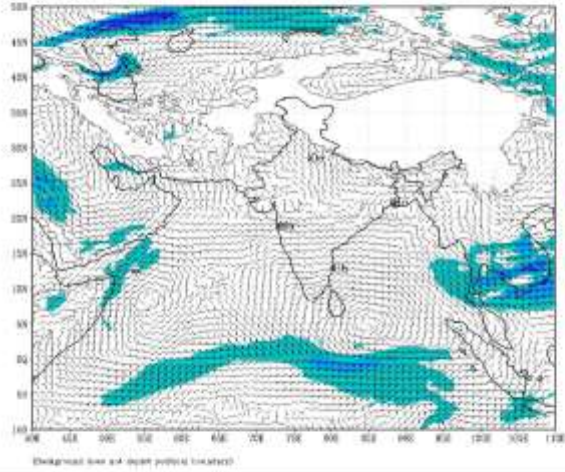
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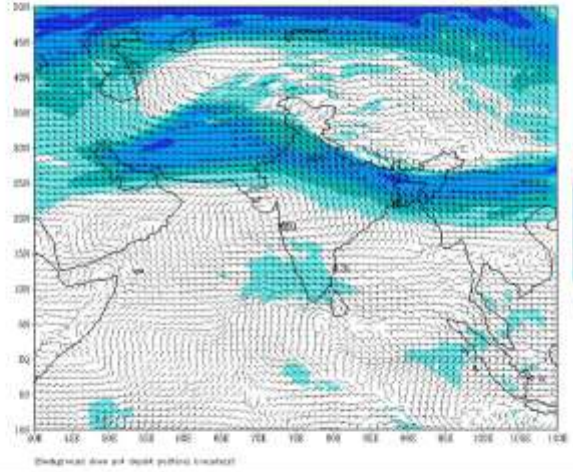
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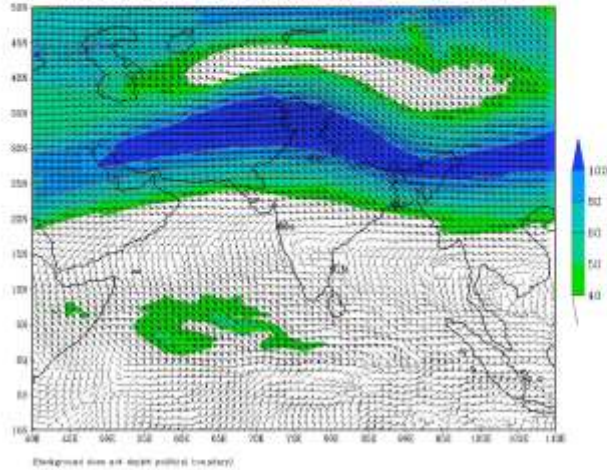
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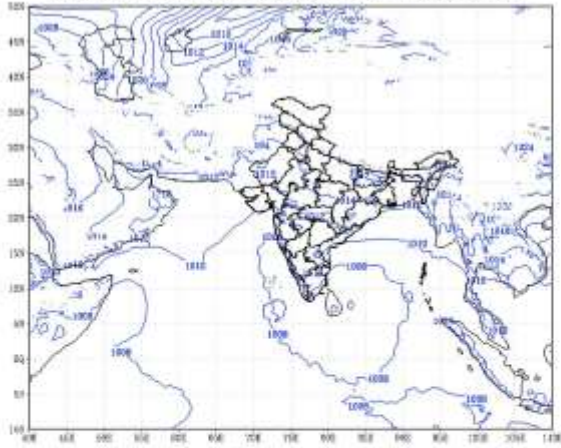
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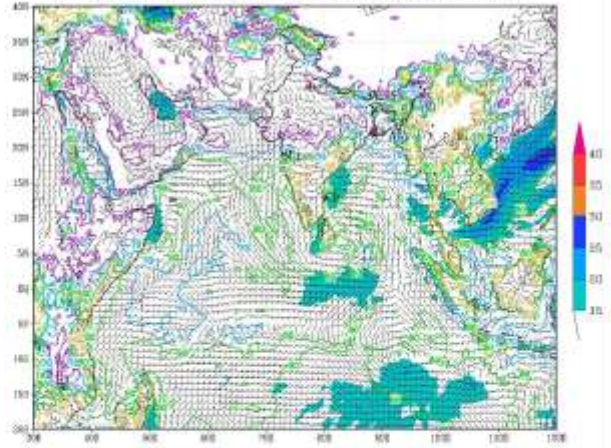


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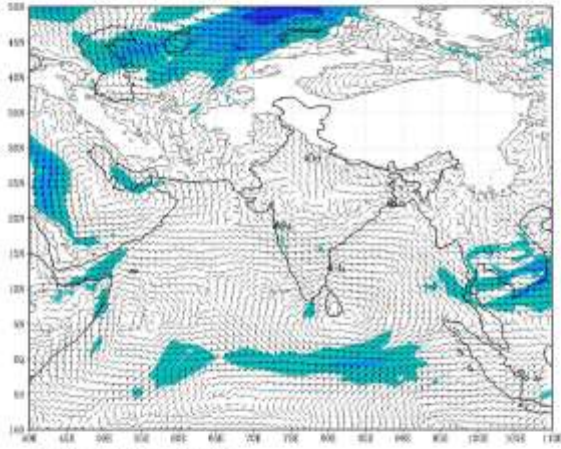
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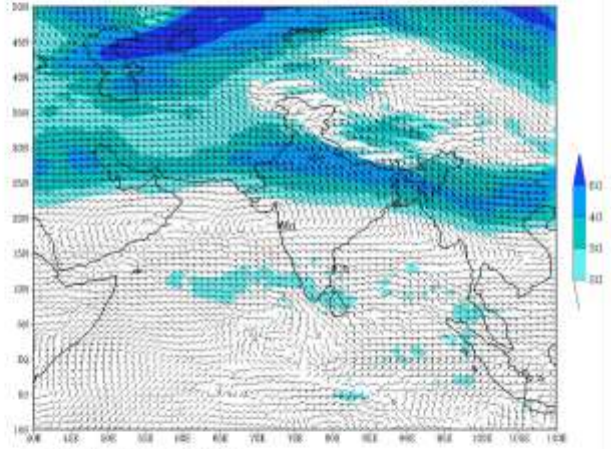
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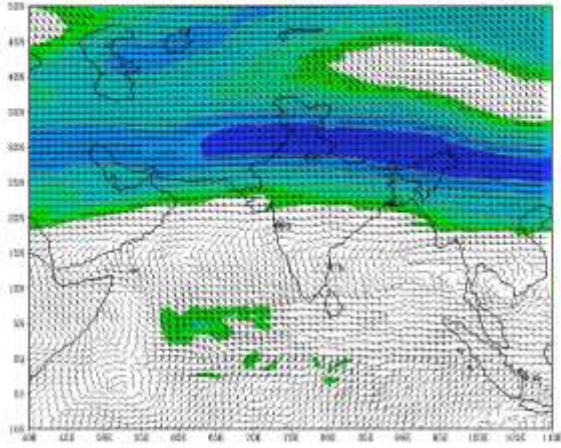
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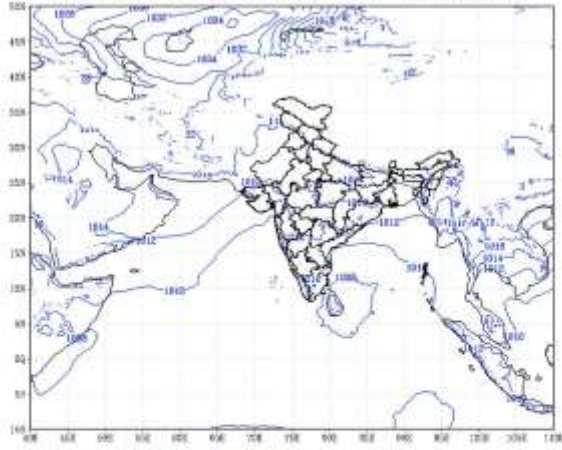
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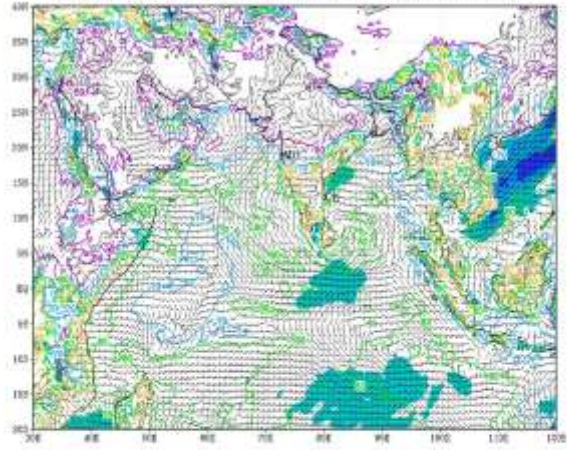
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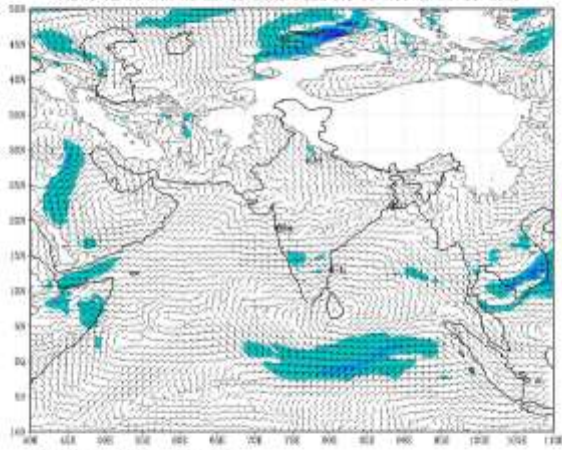
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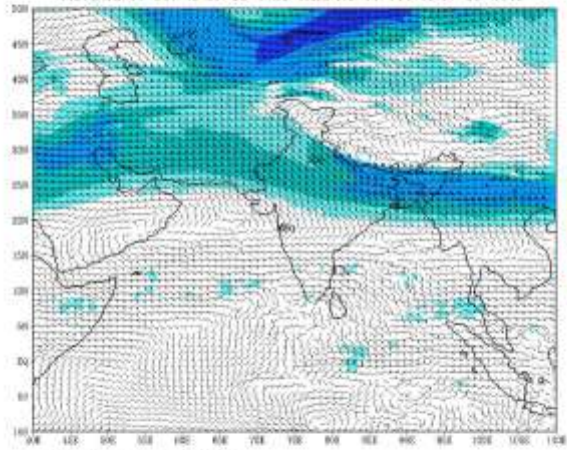
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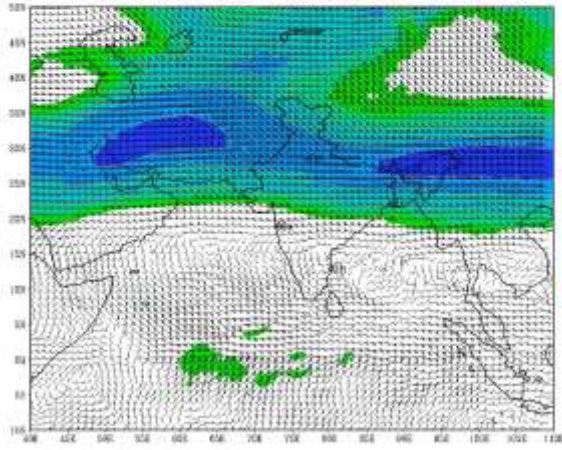
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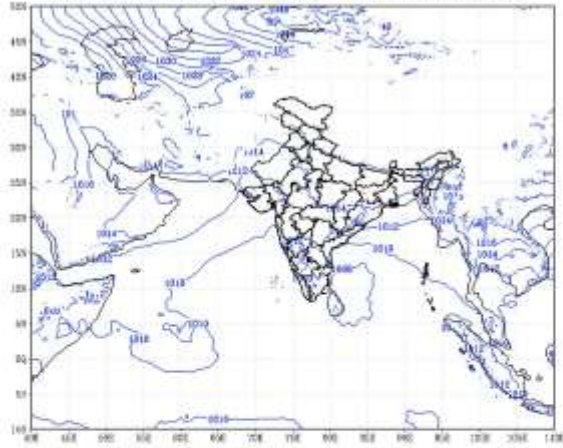
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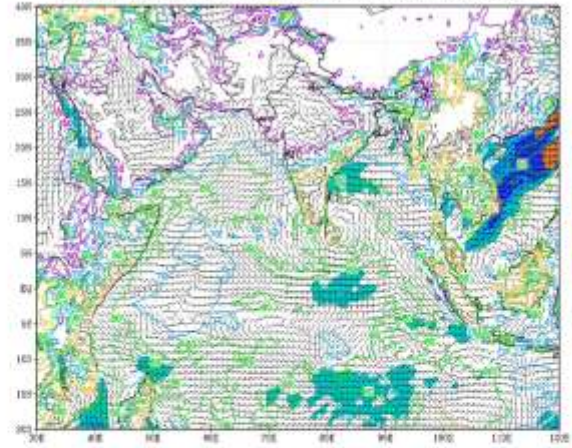


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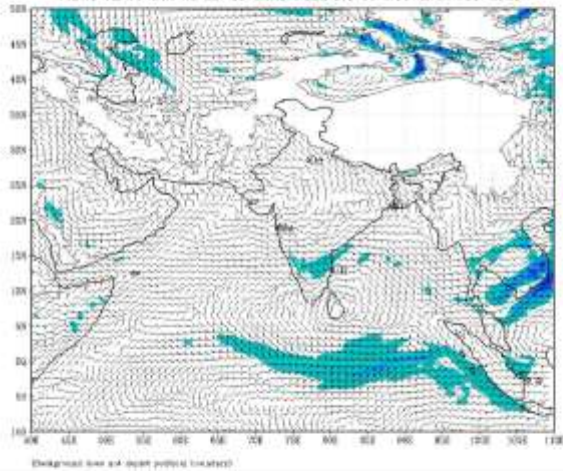
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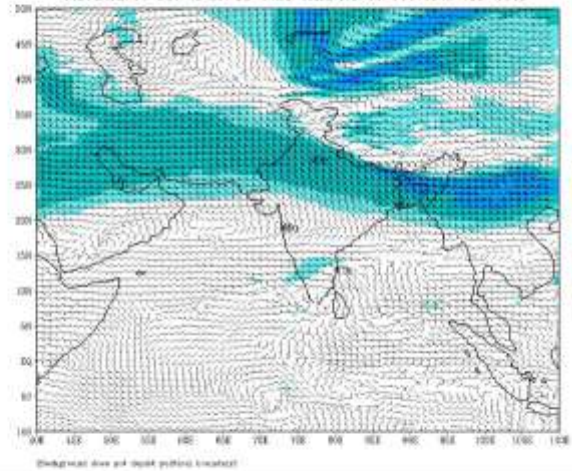
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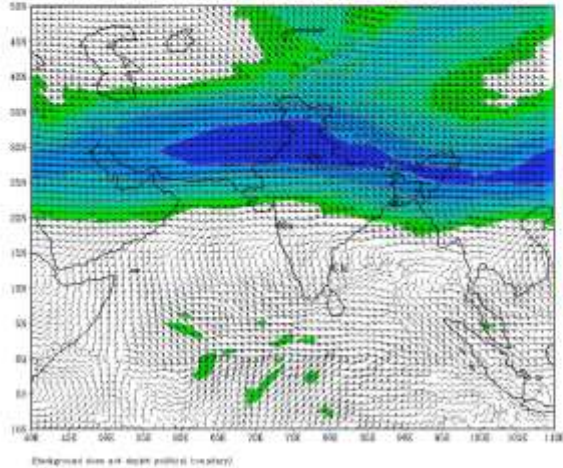
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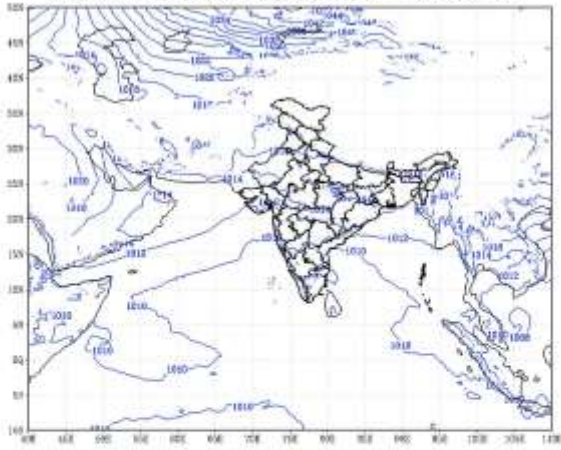
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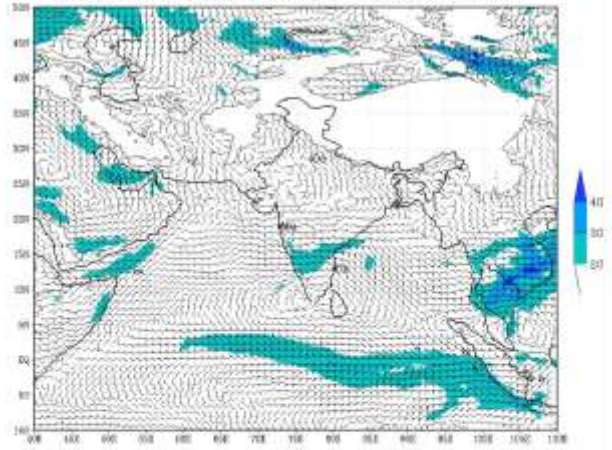


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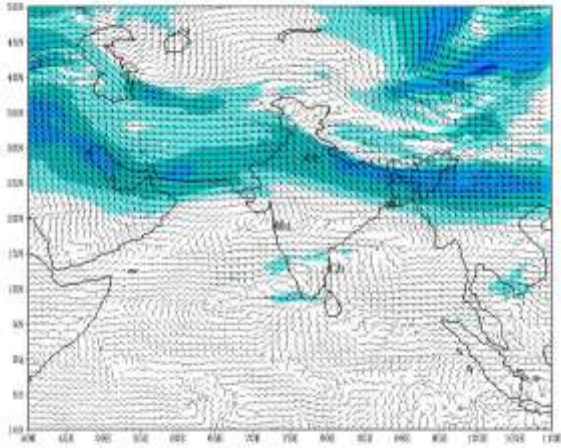
(Background line art depicts political boundaries)

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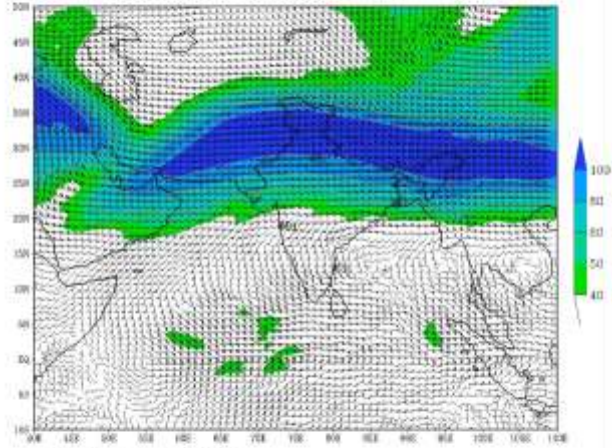
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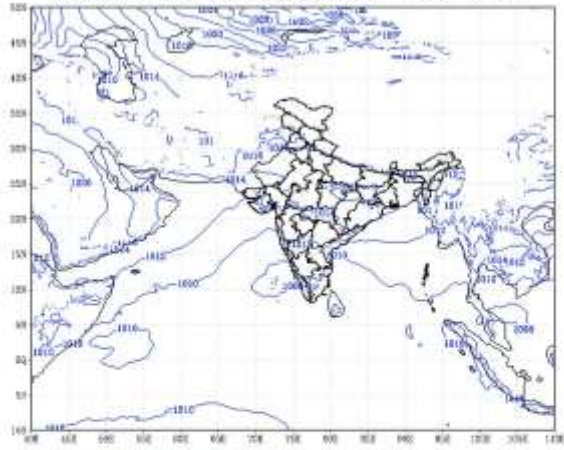
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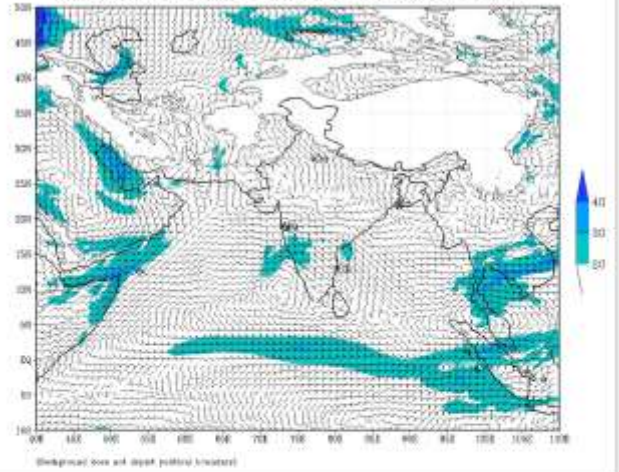


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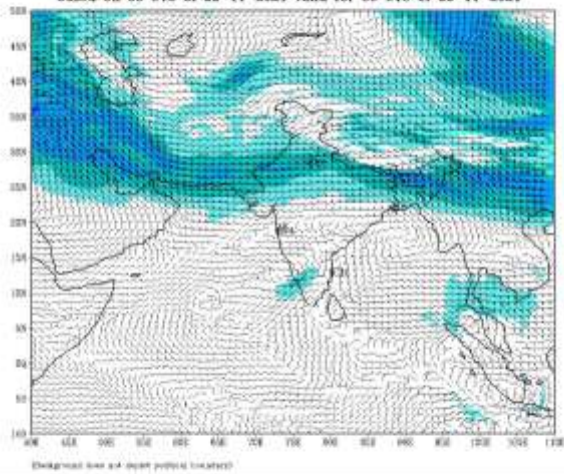
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based on 00 UTC of 22-11-2021 valid for 00 UTC of 29-11-2021



IMD:GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 22-11-2021 valid for 00 UTC of 29-11-2021



IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
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