



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

**Tropical Cyclone Forecast Programme
Report Dated 16th October, 2022**

Time of Issue: 1400 UTC

Synoptic features (based on 0900 UTC analysis):

- ❖ Yesterday's cyclonic circulation over Westcentral Bay of Bengal and along & off South Andhra Pradesh & North Tamilnadu coasts became less marked at 0300 UTC of today, the 16th October.
- ❖ A cyclonic circulation lies over southeast Arabian Sea & adjoining Kerala coast in lower tropospheric levels and a trough runs from this cyclonic circulation to southwest Bay of Bengal in lower tropospheric levels
- ❖ A fresh cyclonic circulation is likely to form over north Andaman Sea & neighbourhood around 18th October 2022. It would move west northwestwards towards westcentral and adjoining southwest Bay of Bengal becoming low pressure area around 20th October, 2022.

Dynamical and thermo-dynamical features

Parameter	Bay of Bengal (BoB)	Arabian Sea (AS)
Sea Surface Temperature (SST) °C	About 29-31°C over entire BoB and Andaman Sea except over some parts of southwest BoB and over Comorin Area.	28-29°C over extreme north AS, southeast & adjoining eastcentral AS and off Maharashtra-South Gujarat coasts. 26-28°C over eastcentral, westcentral and southwest BoB. Less than 26°C off Oman & Somalia coast.
Tropical Cyclone Heat Potential (TCHP) kJ/cm²	(a) 110-120 over eastcentral BoB and Andaman Sea off Myanmar-Thailand coasts & Sumatra Islands. (b) 60-80 over western parts of BoB and parts of southeast BoB. (c) 30-40 over some parts of westcentral & southwest BoB off TamilNadu & Andhra Pradesh coasts and Comorin Area.	(a) 60-80 over eastcentral & also along & off west coast of India.
Cyclonic Relative vorticity (X10⁻⁶s⁻¹)	(a) Positive vorticity of 30-40 south Andaman Sea and adjoining southeast BoB with vertical extension upto 500 hPa level.	(a) Positive vorticity of 30-40 over central AS with vertical extension upto 500 hPa level. (b) 30-40 over southwest AS off Oman-Yemen coasts.

		(c) 20-30 over Comorin area, Lakshadweep area and adjoining southeast AS
Low Level convergence ($\times 10^{-5} \text{ s}^{-1}$)	5-10 over south Andaman Sea and adjoining Gulf of Thailand and off Sumatra Islands. Small zone of value 05 over southwest BoB and another zone of 05 over Comorin Area.	Small zones of value 05 over eastcentral AS off Karnataka coast and others over eastcentral AS and southwest AS.
Upper Level divergence ($\times 10^{-5} \text{ s}^{-1}$)	Divergence has further organized during past 24 hours. 05-20 over south Andaman Sea and southeast BoB.	05-10 over southeast & adjoining eastcentral AS off Kerala-Karnataka coasts. Well organized 05-20 over southwest AS.
Vertical Wind Shear (VWS knots)	5-20 (favourable) over major parts of central BoB and north BoB. 25-30 (unfavourable) over extreme south BoB & adjoining EIO and off South Sri Lanka coast.	5-20 (favourable) over central & adjoining south AS. 15-20 over westcentral & adjoining southwest AS. 25-30 (unfavourable) over Comorin and Maldives.
Wind Shear Tendency (knots)	Decreasing over south Andaman Sea and southwest BoB off TamilNadu coast.	Decreasing over westcentral & adjoining southwest AS.
Upper tropospheric Ridge	Along 20.0°N over the BoB.	Along 20.0°N over the AS.

Satellite observations based on INSAT imagery (0900 UTC):

(a) Over the BoB & Andaman Sea:-

At 0900 UTC, scattered to broken low and medium clouds with embedded intense to very intense convection lay over south BoB and South Andaman Sea. Scattered low and medium clouds with embedded isolated moderate to intense convection lay over North BoB, eastcentral BoB and North Andaman Sea.

(b) Over the Arabian Sea:-

At 0900 UTC, scattered low and medium clouds with embedded intense to very intense convection lay over central AS and Lakshadweep Islands. Scattered low and medium clouds with embedded weak to moderate convection lay over southwest AS and Comorin area.

M.J.O. Index:

MJO index is currently in Phase 6 with amplitude greater than 1. It will continue in same phase for next 7 days with amplitude remaining greater than 1.

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

Vortex (NESAT) over South China Sea and neighbourhood near 19.7N / 120.0E with intensity T.No./C.I. No. 4.0/4.0 at 0600 UTC. Associated broken low and medium clouds with embedded intense to very intense convection lay over area between latitude 17.0N & 22.5N and longitude 115.0E & 123.0E, North Philippines and Taiwan.

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

MODEL GUIDANCE	BoB	AS
IMD-GFS	<p>Cyclonic circulation (Cycir) over southwest BoB, on 16th becoming less marked over North Tamil Nadu on 17th. A fresh cycir likely to form over North Andaman Sea and adjoining eastcentral BoB on 17th. It is likely to move nearly westwards and lie over southeast BoB as a cycir during 18th to 20th, as low on 21st & 22nd over southwest BoB, depression over southwest BoB on 23rd & 24th, low over southwest BoB on 25th and less marked on 26th.</p> <p>Another cycir likely to emerge into Andaman Sea on 22nd. Lies as a low (low pressure area) over North Andaman Sea on 23rd, cyclonic storm (CS) over westcentral & adjoining northwest BoB on 24th, severe cyclonic storm (SCS) over central parts of North BoB on 25th and less marked on 26th.</p>	<p>A cycir lies over central parts of south AS with near westwards movement till 18th.</p>
IMD-GEFS	<p>Extended circulation over central & adjoining south BoB during 17th to 20th. Lies as a low over southwest BoB on 21st, westcentral & adjoining southwest BoB on 22nd, well marked low pressure area (WML) over same region on 23rd, depression over central parts of BoB on 24th.</p>	<p>A cycir lies over southeast AS on 16th. Moving nearly westwards lies over southwest & adjoining southeast AS on 17th, southwest AS on 18th, becoming less marked on 19th. A fresh cycir over eastcentral AS off Maharashtra-Goa coasts during 17th-19th.</p>
IMD-WRF	<p>Cycir over interior TamilNadu on 16th becoming less marked thereafter.</p> <p>Another cycir over south Andaman Sea on 16th. Lies as a cycir over central parts of Andaman Islands on 17th, over eastcentral BoB on 18th & westcentral BoB on 19th with gradual west-northwestwards movement.</p>	<p>A cycir lies over southeast AS on 17th, lies over central & adjoining south AS on 18th, becoming less marked on 19th. Another cycir over eastcentral AS off Maharashtra-Goa coasts on 17th, lies as a cycir over eastcentral AS on 18th & 19th.</p>
NCMRWF-NCUM	<p>A cycir likely to form over North Andaman Sea on 16th & 17th. It is likely to move west-northwestwards and lie over central BoB on 18th, as a low over westcentral BoB on 19th, as a WML over westcentral & adjoining southwest BoB on 20th, as a depression over southwest & adjoining westcentral BoB on 21st, Cyclonic Storm over southwest & adjoining westcentral BoB off Chennai coast on 22nd and as depression over North interior TamilNadu on 23rd, WML over Karnatak coast on 24th. WML over</p>	<p>A cycir lies over central AS on 16th, lies as LPA over southwest AS on 17th & 18th with gradual southwestwards movement and less marked thereafter. Fresh cycir over</p>

	Maharashtra-Goa coast on 25 th and less marked thereafter.	eastcentral AS on 18 th off Maharashtra coast, extended circulation over eastcentral AS upto southwest AS on 19 th , low over central AS on 20 th and less marked thereafter.
NCMRWF-NEPS	A cycir likely to form over central parts of BoB on 17 th . It is likely to move west-northwestwards and lie as a low over westcentral & adjoining southwest BoB on 18 th , WML over southwest & adjoining westcentral BoB on 19 th & depression over same region on 20 th , as a deep depression over southwest & adjoining westcentral BoB on 21 st , SCS over Chennai on 22 nd and depression over north interior Karnataka on 23 rd , depression over coastal Karnataka on 24 th , WML over same region on 25 th and less marked thereafter.	A cycir lies over southeast & adjoining eastcentral AS during 16 th – 18 th , low over eastcentral AS on 19 th , cycir over central AS on 20 th becoming less marked on 21 st .
NCMRWF-UM (Regional)	Cycir lies over eastcentral BoB on 16 th and 17 th ., LPA over eastcentral BoB on 18 th becoming more marked on 19 th over the same region.	A cycir lies over southeast & adjoining eastcentral AS, persist over same region on 17 th , lies over central & adjoining south AS on 18 th , becoming less marked on 19 th
ECMWF	A cycir over central Andaman Sea on 16 th & over eastcentral BoB on 17 th & 18 th & westcentral BoB on 19 th , westcentral & adjoining southwest BoB on 20 th , low over south & adjoining central BoB on 21 st , WML/ depression over westcentral BoB on 22 nd and depression over westcentral & adjoining southwest BoB on 23 rd , deep depression over westcentral BoB on 24 th and cyclonic storm over North Andhra Pradesh & adjoining South Odisha on 25 th , WML over North Odisha on 26 th .	A cycir lies over southeast & adjoining eastcentral AS, on 16 th , lies over westcentral AS on 17 th , low over westcentral AS on 18 th weakening thereafter..
ECMWF-EPS	Not available	
NCEP-GFS	Cyclonic circulation (Cycir) over southwest BoB, on 16 th becoming less marked over North Tamil Nadu on 17 th . A fresh cycir likely to form over North Andaman Sea and adjoining eastcentral BoB on 17 th . It is likely to move nearly westwards and lie over southeast BoB as a cycir on 18 th , as low over eastcentral BoB on 19 th , depression over eastcentral BoB on 20 th , deep depression over westcentral BoB on 21 st , cyclonic storm over westcentral BoB on 22 nd , severe cyclonic storm over westcentral BoB on 23 rd , crossing North Andhra Pradesh-South Odisha coast as a VSCS on 24 th .	A cycir lies over central parts of south AS with near westwards movement till 18 th .
IMD-Genesis Potential Parameter	A Potential zone over South Andaman Sea & adjoining Gulf of Thailand on 17 th & 18 th , another zone over eastcentral BoB on 18 th . Two potential zones over North Andaman Sea & eastcentral BoB on 19 th , merger of two zones into a single consolidated zone over North Andaman Sea & adjoining eastcentral BoB, single	Potential zone over southeast AS during 19 th – 20 th , over eastcentral AS on 21 st off Karnataka coast, consolidated single

	consolidated circular zone over central parts of BoB on 21 st , slight weakening of potential zone over westcentral BoB on 22 nd , consolidated zone over westcentral BoB on 23 rd	zone over eastcentral AS on 22 nd & 23 rd ,
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Summary and conclusion:

1. For the Bay of Bengal:

There is large variation among various models w.r.t. development of fresh cycir over Andaman Sea and it's movement & intensification. Most of the models are indicating development of cycir over Andaman Sea during 16th-18th. However, NCUM group is indicating it's intensification into low around 18th, while GFS group & ECMWF are indicating formation of low around 20th. Similarly NCUM group is indicating depression around 21st and GFS & ECMWF around 23rd. There is also variation among various models wrt track of the system. NCUM group is indicating nearly westwards movement towards North Tamil Nadu. GFS & ECMWF are indicating nearly north-northwestwards movement towards North Andhra Pradesh-south Odisha. However, most of the models are indicating intensification of the system into a cyclonic storm.

Hence, it is inferred that, a fresh cycir is likely to form over central and adjoining North Andaman Sea around 17th/ 18th. It is likely to move west-northwestwards, become a low around 19th/20th over eastcentral & adjoining southeast BoB and concentrate into a depression over westcentral & adjoining southwest BoB around 22nd. Further intensification needs to be monitored.

The environmental conditions like SST and ocean thermal energy are favourable over south & central BoB for formation of low/depression. The La Nina conditions supported with negative IOD conditions will support the movement of remnant circulations from South China Sea to Andaman Sea with possible further intensification. However, MJO being in phase 6 with amplitude more than 1, will not be supportive for amplification of convection and hence the system.

2. For the Arabian Sea:

The cycir over southeast & adjoining Kerala coast is likely to persist over same region during 16th & 17th , lie over central & adjoining south AS on 18th and become less marked thereafter.

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	LOW	MODERATE

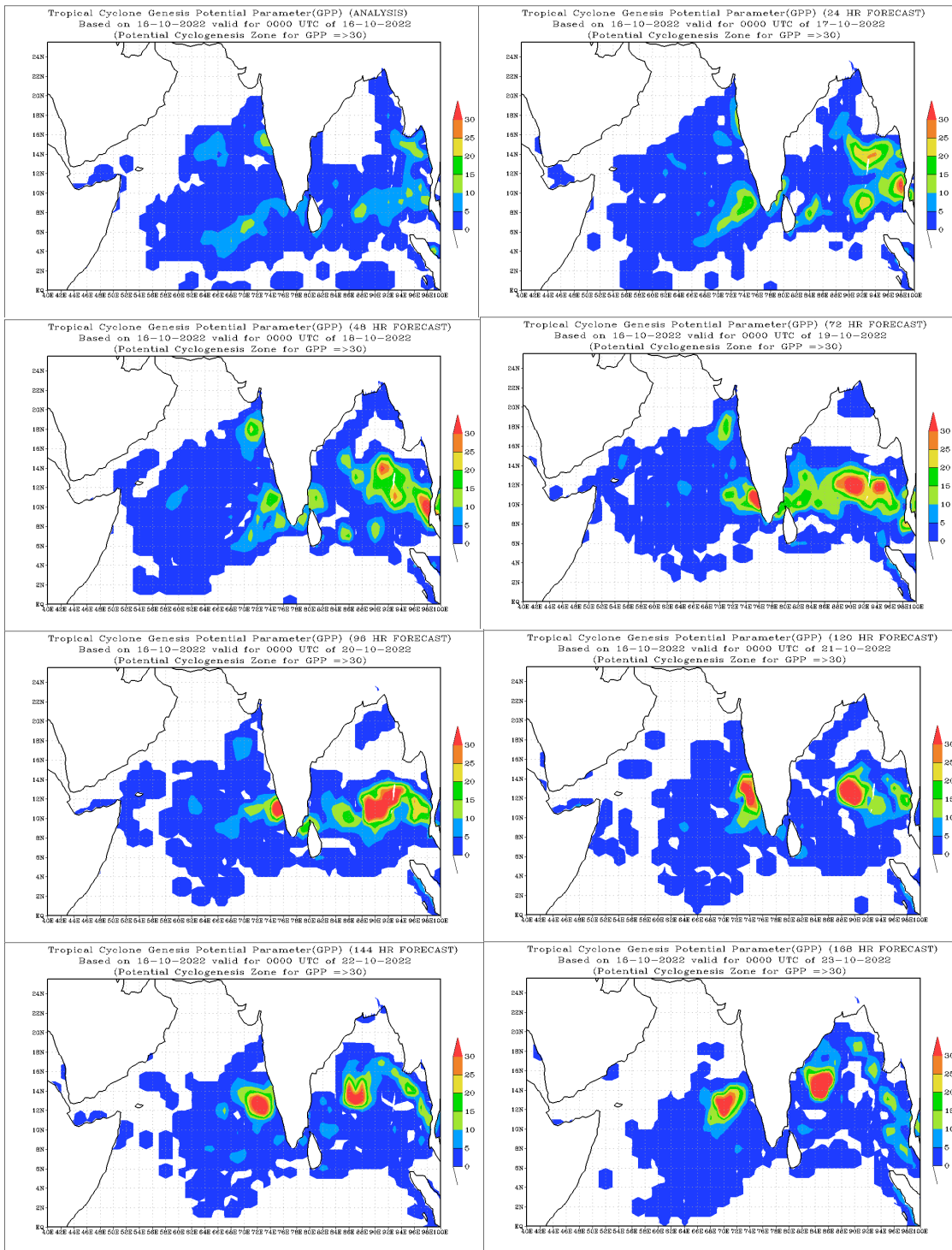
Probability of cyclogenesis (formation of depression and above intensity systems) over the Arabian Sea during next 168 hours:

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

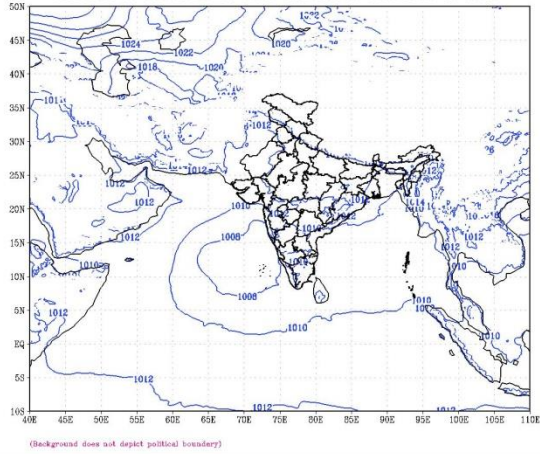
Advisory:

The intensification & movement of cycir likely to form over Andaman Sea around 17th/18th need to be monitored.

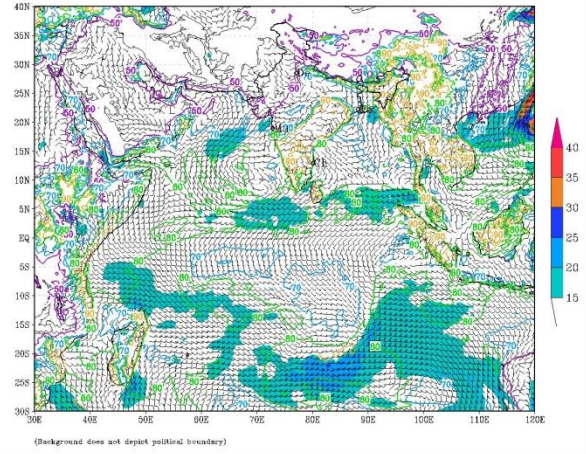
IOP is suggested for Andaman & Nicobar Islands on 19th.



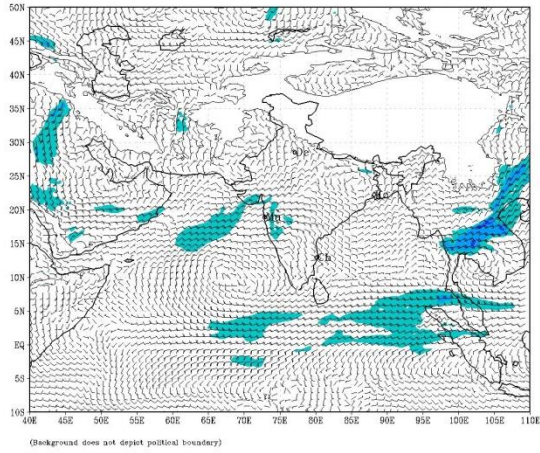
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based on 00 UTC of 16-10-2022 valid for 00 UTC of 16-10-2022



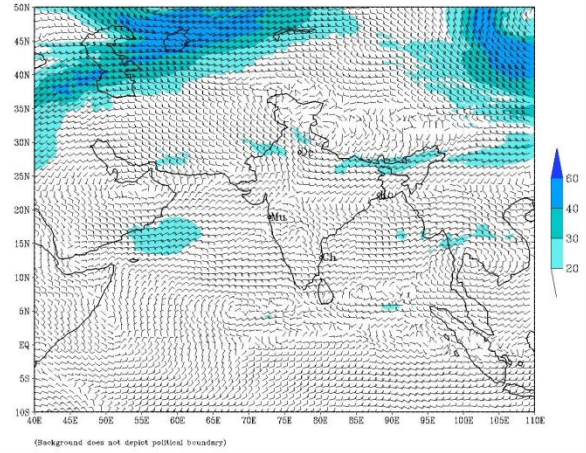
IMD GFS (T1534) 10m WIND (kt) AND 2m RH (%) FORECAST (00 HR)
based on 00 UTC of 16-10-2022 valid for 00 UTC of 16-10-2022



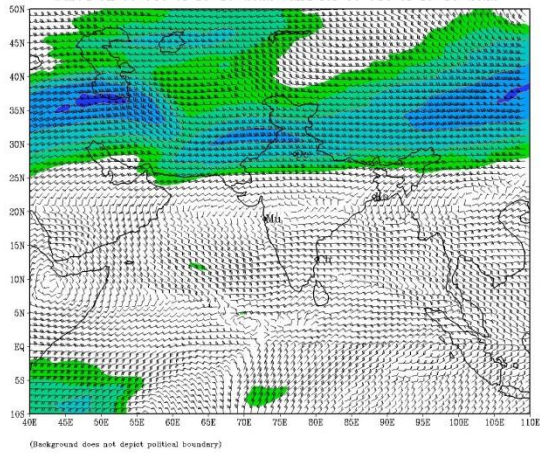
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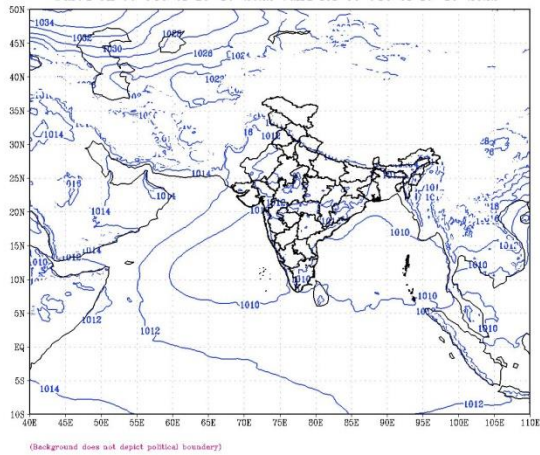
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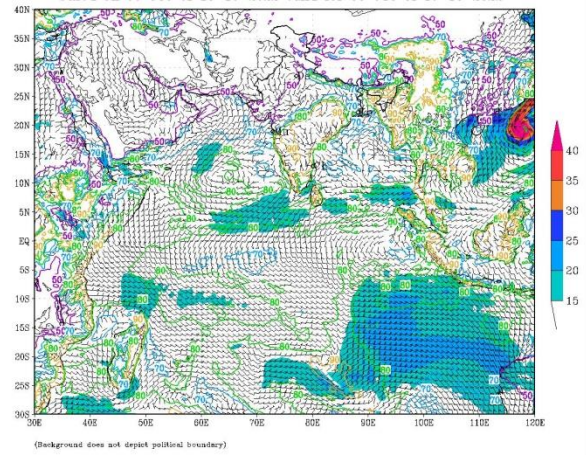
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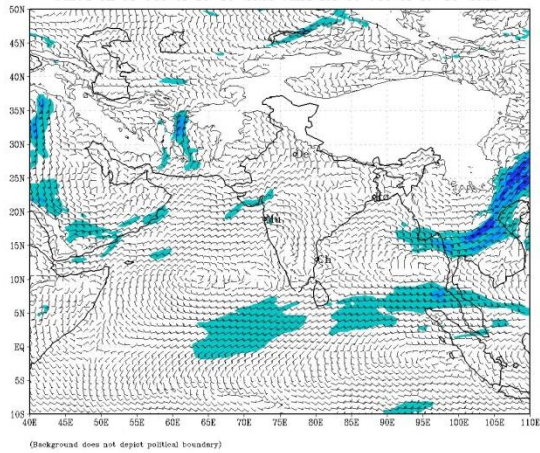
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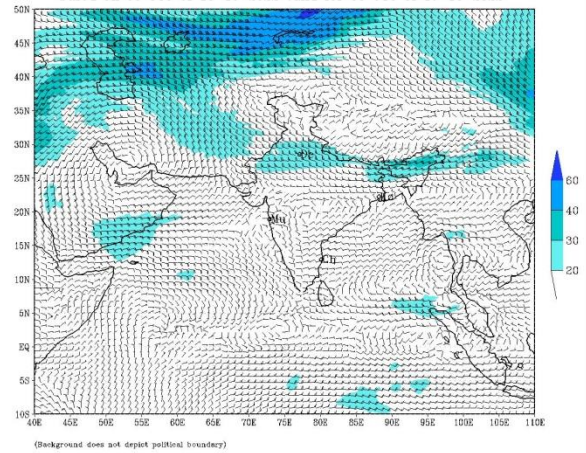
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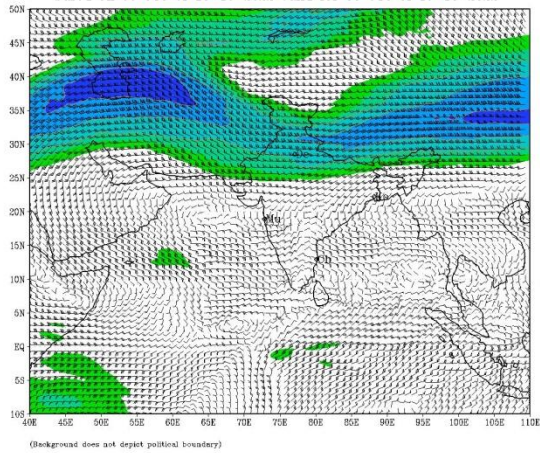
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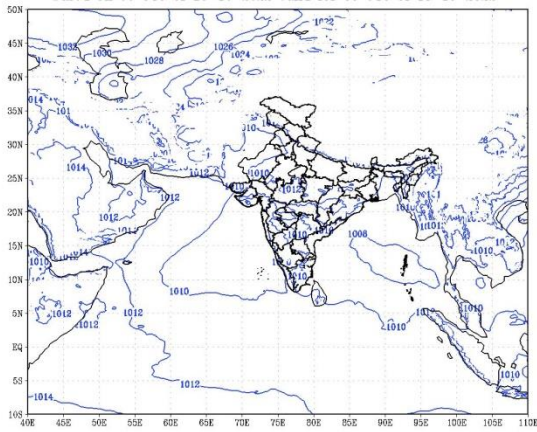
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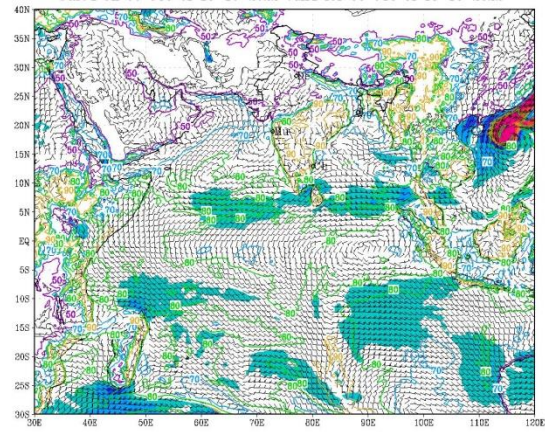


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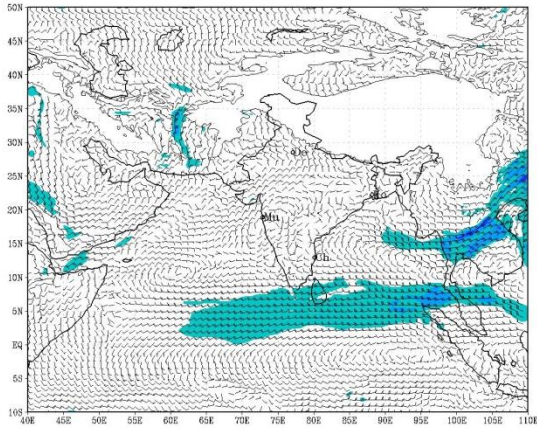
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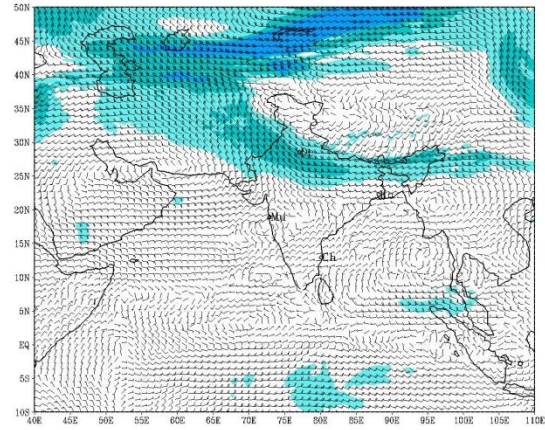
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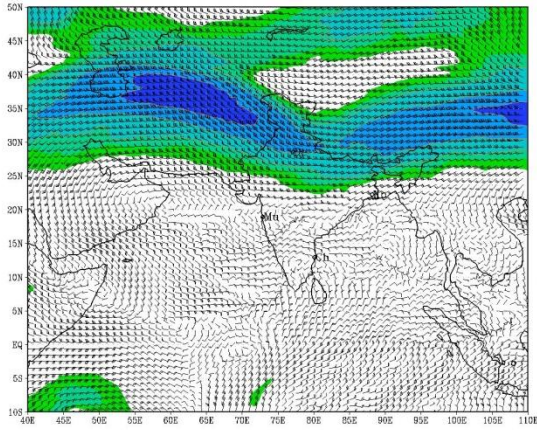
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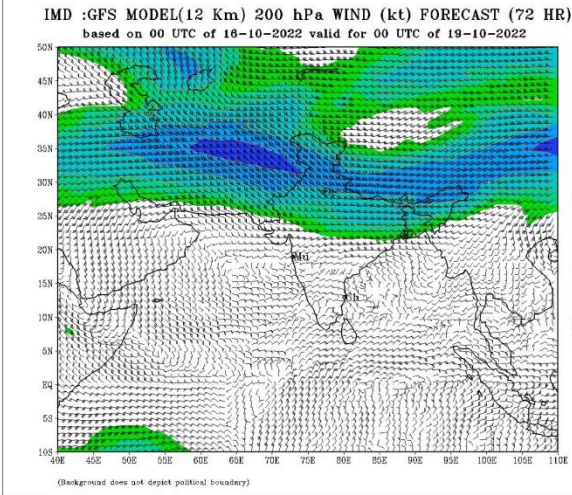
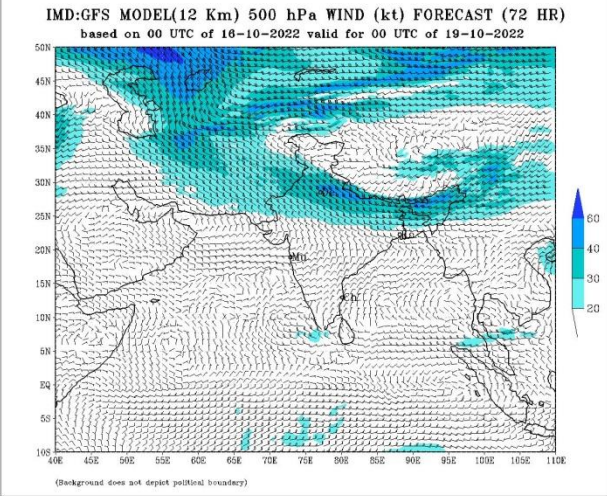
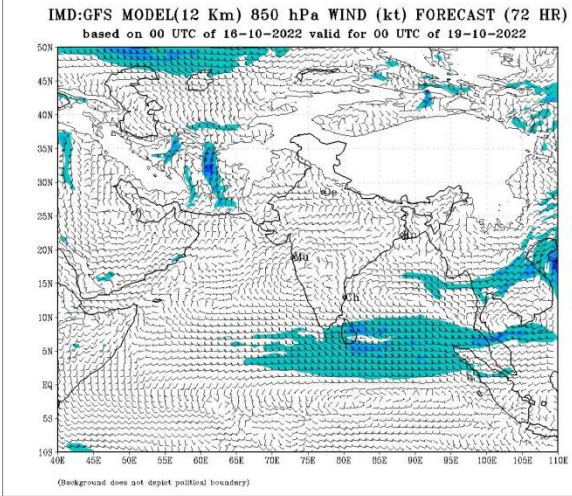
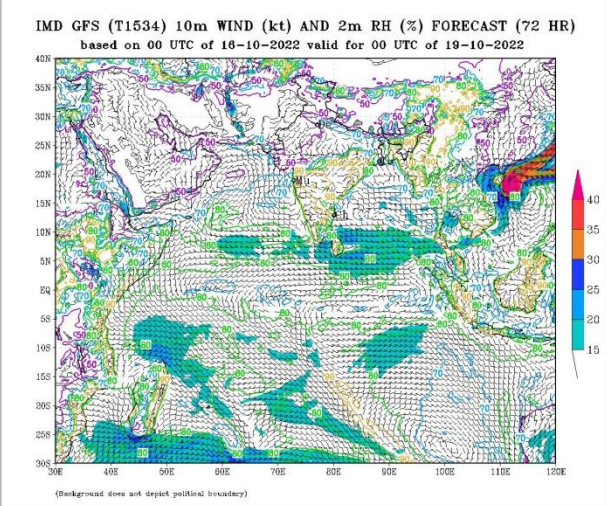
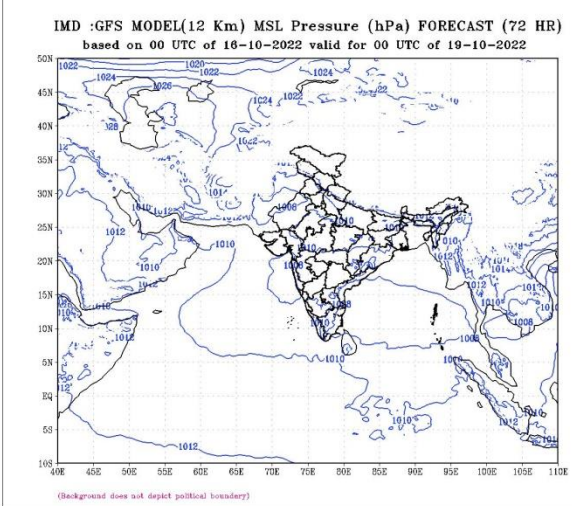


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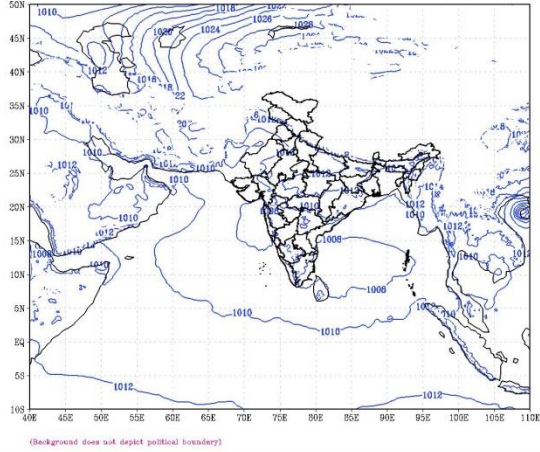
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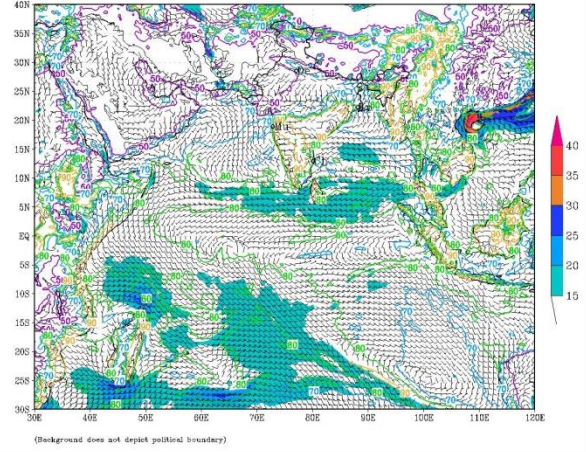
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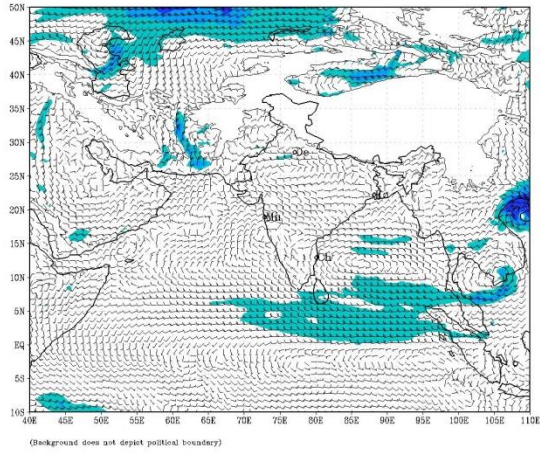
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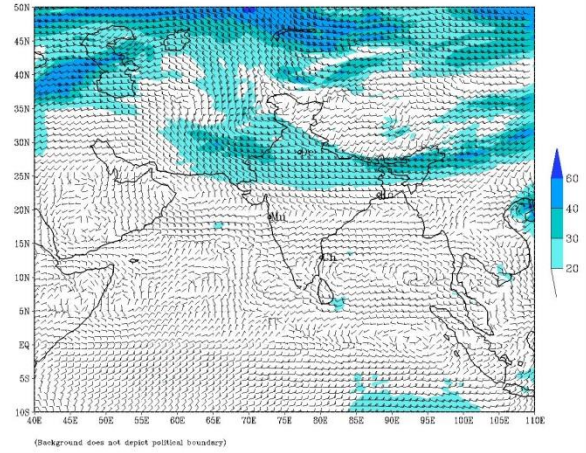
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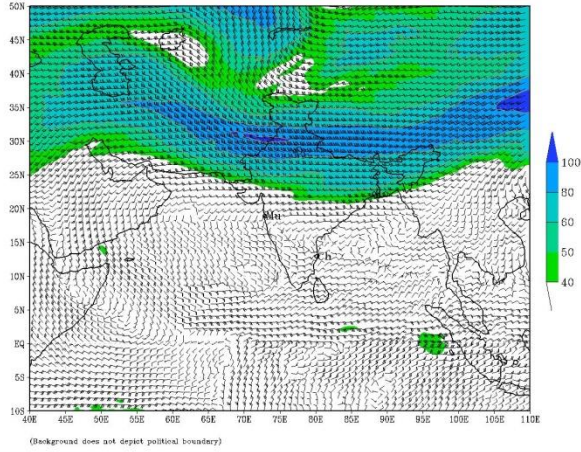
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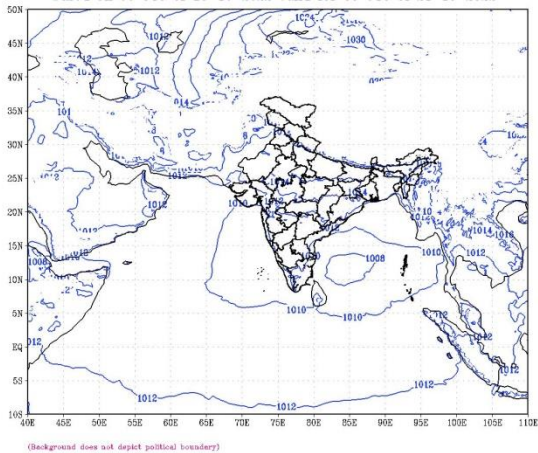
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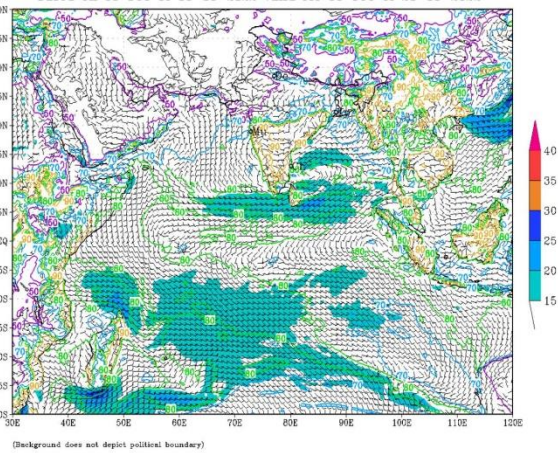
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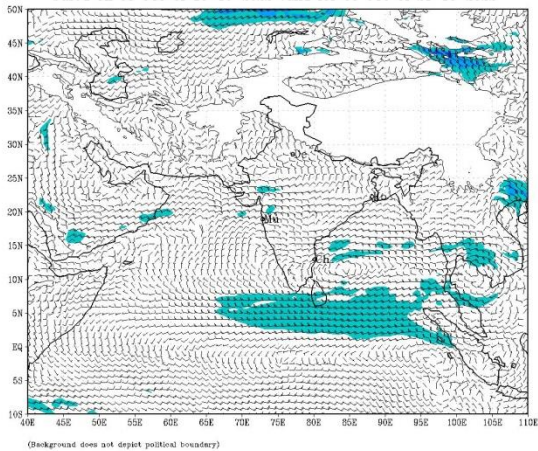
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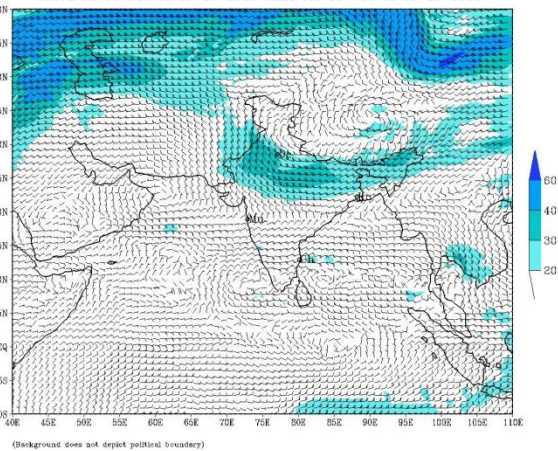
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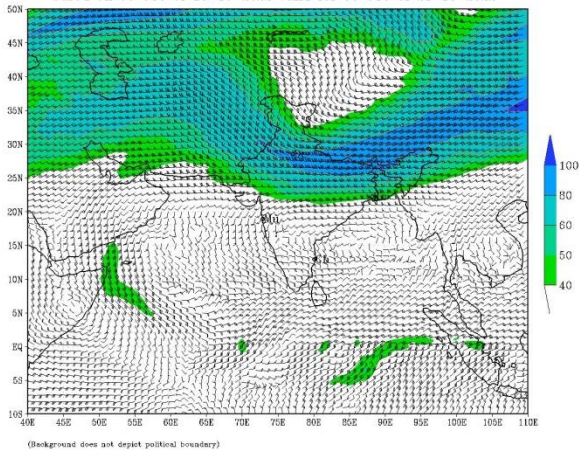
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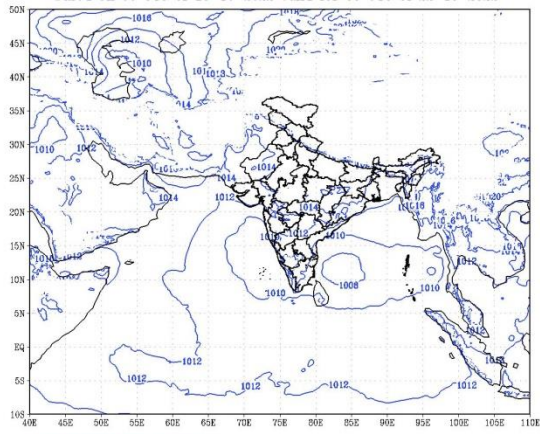
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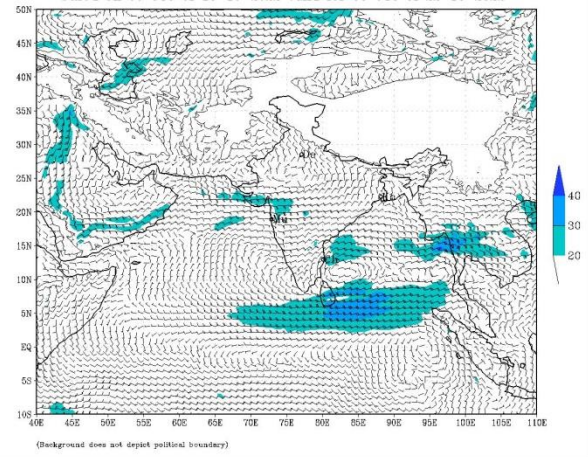
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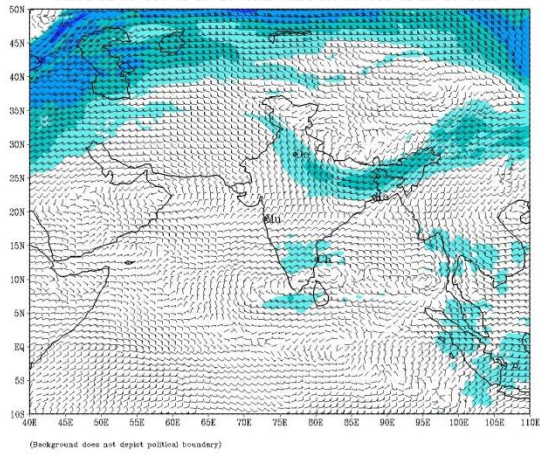
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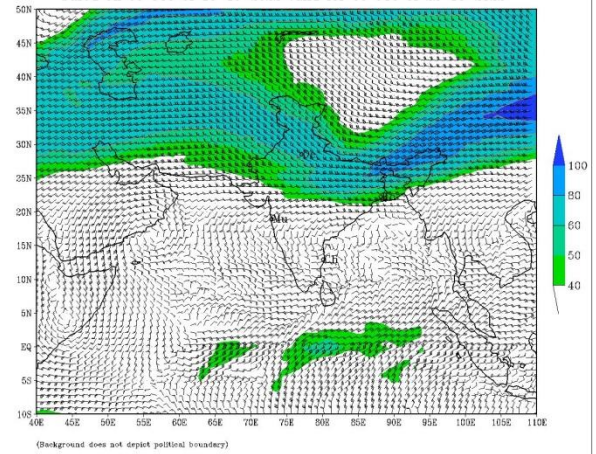
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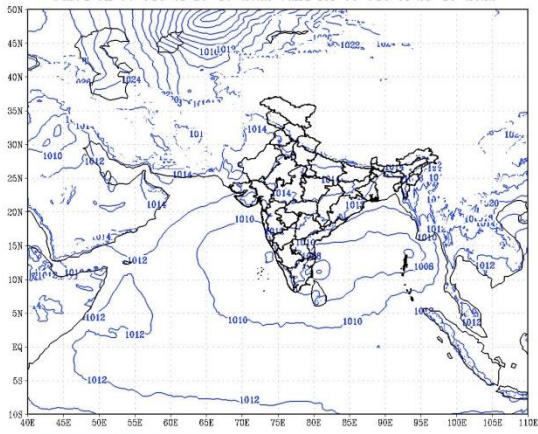
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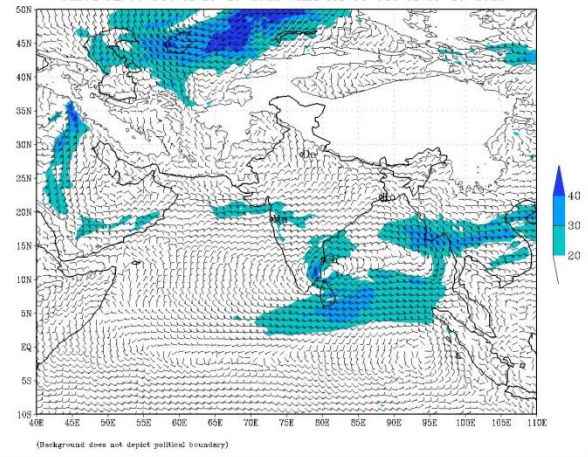
IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (144 HR)
based on 00 UTC of 16-10-2022 valid for 00 UTC of 22-10-2022



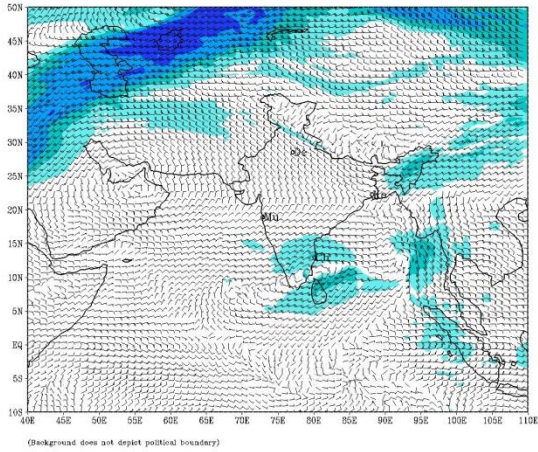
IMD :GFS MODEL(12 Km) MSL Pressure (hPa) FORECAST (168 HR)
based on 00 UTC of 16-10-2022 valid for 00 UTC of 23-10-2022



IMD :GFS MODEL(12 Km) 850 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 16-10-2022 valid for 00 UTC of 23-10-2022



IMD :GFS MODEL(12 Km) 500 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 16-10-2022 valid for 00 UTC of 23-10-2022



IMD :GFS MODEL(12 Km) 200 hPa WIND (kt) FORECAST (168 HR)
based on 00 UTC of 16-10-2022 valid for 00 UTC of 23-10-2022

