



# India Meteorological Department

## FDP STORM Bulletin No. 23 (29-03-2018)

### 1. CURRENT SYNOPTIC SITUATION:

#### NWFC INFERENCE (0300UTC of the Day):

- The remnant Western Disturbance as a trough in mid & upper tropospheric westerlies now runs with its axis at 5.8 km above mean sea level roughly along 85°E to the north of Lat. 27°N.
- A fresh Western Disturbance is likely to affect Western Himalayan Region from 2nd April.
- The core of sub-tropical westerly Jet stream is seen mainly over Northeast India between Lats. 23°N and 26°N at 9.5 km above mean sea level over the Indian region.
- The east-west trough from northern parts of Bihar to Manipur now runs from northern parts of Bangladesh to Manipur across Assam & Meghalaya, extending upto 0.9 km above mean sea level.
- The cyclonic circulation over Gangetic West Bengal and adjoining Jharkhand now lies over Odisha and neighbourhood at 0.9 km above mean sea level.
- A north-south trough at 0.9 km above mean sea level runs from southeast Uttar Pradesh to South Interior Karnataka across East Madhya Pradesh, Vidarbha, Telangana and north interior Karnataka.
- The cyclonic circulation extending upto 0.9 km above mean sea level over North Interior Karnataka and adjoining areas of Telangana and Marathawada has merged with the above trough.
- The cyclonic circulation over Equatorial India Ocean and adjoining Sri Lanka and Comorin area now lies over comorin area and neighbourhood at 1.5 km above mean sea level.

#### SATELLITE OBSERVATIONS during past 24hrs and current observation:

##### Current Observation (based on 0600UTC imagery of INSAT 3D):

##### Western Disturbance (WD):

Scattered multi-layered clouds seen over East Tibet adjoining china, and over the area between lat 37 .0°N to 46.0°N, long 70.0°E to 100.0°E in association with WD over the area.

Scattered multi-layered clouds seen over South Caspian Sea, North Iran and neighbourhood in association with another WD over the area.

**Convective Activity:**

Cell No	Date/Time(UTC)	Area/Location	MINIMUM CTT (°C)	Remarks
1	290300	West Assam	-47	--
	290600	do	-35	Weak
2	290300	Manipur adjoining Assam	-40	--
	290600	do	--	Dissipated
3	290600	Sub-Himalayan West Bengal	-50	

**Clouds description within India:**

Scattered low/medium clouds with embedded moderate to intense convection seen over Sub-Himalayan West Bengal. Scattered low/medium clouds with embedded isolated weak to moderate convection seen over Sikkim, East Meghalaya and West Assam. Scattered low/medium clouds with embedded isolated weak convection seen over South Kerala. Scattered low/medium clouds seen over Jammu & Kashmir, North Himachal Pradesh, North Uttarakhand, Sikkim and rest North-eastern States. Isolated to scattered low/medium clouds seen over rest Kerala, Tamilnadu and Nicobar Islands. Isolated low/medium clouds seen West Madhya Pradesh, extreme South Maharashtra.

**Arabian Sea:**

Scattered low/medium clouds with embedded isolated weak convection seen over West- Central Arabian Sea.

**Bay of Bengal & Andaman Sea:**

Broken low/medium clouds with embedded isolated weak to moderate convection seen over South Andaman Sea.

**Past Weather:****Convection (during last 24 hrs):**

Moderate to intense convection was observed over Sikkim Assam Meghalaya Tripura Manipur Mizoram.

**OLR:-**

Upto  $230 \text{ } \mu\text{m}^{-2}$  was observed over J&K North Himachal Pradesh North Uttarakhand Sikkim north SHWB Arunachal Pradesh Assam Meghalaya Nagaland Manipur north Andhra Pradesh and South Kerala.

**Precipitation:****IMR:**

Rainfall upto 01-10 mm observed over NW and east J&K north Himachal Pradesh extreme north Uttarakhand west & south-east Assam central Manipur central Karnataka central Kerala and south Tamilnadu.

**HEM:**

Rainfall upto 1-14 mm observed over west Assam adjoining Sub-Himalayan West Bengal west Meghalaya Manipur adjoining Assam some parts of central Karnataka Kerala and south Tamilnadu.

**RADAR and RAPID RGB Observation:**

Isolated/multiple echoes are seen over East Rayalaseema adjoining Coastal Andhra Pradesh, Odisha, South Interior Karnataka, West Assam, adjoining Meghalaya in DWR composite at 1610 IST.

RAPID RGB Satellite imagery at 1600IST indicates significant convection over Himachal Pradesh, North Uttarakhand, Sub-Himalayan West Bengal, West Assam, Meghalaya, Arunachal Pradesh, Manipur, South Interior Karnataka, Coastal Andhra Pradesh, Odisha and Nicobar Islands.

**Environmental Condition (dust etc) and its Forecast based on 00UTC of date:**

Higher Dust concentration was observed over Arab countries and northern part of Africa. Dust concentration is expected to increase over north-western part of India for next five days. PM10 concentration is expected to increase over IGP in next five days.

Particulate matter concentration is expected to remain in moderate to poor category for next 2 days in Delhi.

Delhi – SAFAR analysis & Forecast	29.03.2018	30.03.2018
PM10 (micro-g/m3)	177	185
PM2.5 (micro-g/m3)	82	86

**2. NWP MODEL GUIDANCE:****NCMRWF (NCUM forecast based on 00UTC the day):****1. Weather Systems:****Low level CYCIRS, Troughs:**

**12 UTC of Day 0-2:** 850 hPa over Bihar-WB region which forms closed weak cyclonic circulation in Day-3-5 shifting FW wards to over Jharkhand and adjoining Chhattisgarh. Prominent in 700 hPa circulation.

**Confluence & Wind Discontinuity Regions:**

**12 UTC of Day 0-2:** at 925 hPa S-N wind discontinuity over interior peninsula extending SW-NE along the east coast.

**12 UTC of Day 3-4:** at 925 hPa S-N wind discontinuity over interior peninsula.

**Synoptic Systems:**

**12 UTC of Day 1-3:** At 500 hPa westerly trough over Punjab - J & K in Day-0, moving eastwards to over UP in Day-1 to Day-2 and to over east UP and Bihar in Day-3.

**2. Location of jet and jet core (>60kt) at 500hPa:**

**12UTC Day-0 to 1:** over Punjab-J&K shifting eastwards to over UP.

**3. Convergence at 850 hPa:**

**Day/Index: Subdivisions with Lower Level Convergence >  $15 \times 10^{-5}$  /s**

Day0: NE\_NMMT, Jharkhand, Uttarakhand, Odisha, East\_MP, Chhattisgarh, Coastal\_AP, NI\_Karnataka, SI\_Karnataka,

Day1: NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, Odisha, East\_MP, Madhya\_Maharashtra, Chhattisgarh, Coastal\_AP, Telangana, NI\_Karnataka, SI\_Karnataka,

Day2: Assam\_Meghalaya, Gangetic\_WB, Jharkhand, Odisha, East\_MP, Madhya\_Maharashtra, Vidarbha, Chhattisgarh, Telangana, NI\_Karnataka, SI\_Karnataka,

Day3: Gangetic\_WB, Jharkhand, Odisha, Madhya\_Maharashtra, Vidarbha, Chhattisgarh, Telangana, NI\_Karnataka, SI\_Karnataka,

Day4: Odisha, Madhya\_Maharashtra, Chhattisgarh, NI\_Karnataka, SI\_Karnataka

**4. Low level Vorticity:-Positive Vorticity:**

**Day/Index: Subdivisions with Lower Level Vortex >  $15 \times 10^{-5}$  /s**

Day0: Gangetic\_WB, Jharkhand, West\_UP, Uttarakhand, Himachal\_Pradesh, Jammu\_Kashmir, Odisha, Saurashtra\_Kutch, Coastal\_AP, TN\_Puducherry,

Day1: Assam\_Meghalaya, Sub\_Himalayan\_WB, Jharkhand, Bihar, East\_UP, West\_UP, Himachal\_Pradesh, Jammu\_Kashmir, TN\_Puducherry,

Day2: Assam\_Meghalaya, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, Odisha, Konkan\_Goa, Chhattisgarh,

Day3: Jharkhand, East\_MP, Vidarbha, Chhattisgarh,

Day4: NI\_Karnataka

**5. Showalter Index: -3 to -4[Very unstable]:**

**Day/Index: Subdivisions with Showalter Index < -4**

Day0: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Uttarakhand, Himachal\_Pradesh, Coastal\_AP, TN\_Puducherry, Coastal\_Karnataka, SI\_Karnataka, Kerala,

Day1: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, West\_UP, Odisha, Coastal\_AP, TN\_Puducherry, SI\_Karnataka, Kerala,

- Day2: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, West\_UP, Uttarakhand, Odisha, Coastal\_AP, Telangana, TN\_Puducherry,
- Day3: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, Uttarakhand, Himachal\_Pradesh, Jammu\_Kashmir, Odisha, East\_MP, Vidarbha, Chhattisgarh, Coastal\_AP, Telangana, Rayalseema, TN\_Puducherry, SI\_Karnataka, Kerala,
- Day4: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, Uttarakhand, Himachal\_Pradesh, Jammu\_Kashmir, Odisha, East\_MP, Vidarbha, Chhattisgarh, Coastal\_AP, Telangana, Rayalseema, TN\_Puducherry.

## **6. Spatial distribution of TTI: TTI >50 [Scattered Thunderstorms few severe]:**

### **Day/Index: Subdivisions with K Index > 40**

- Day0: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Jharkhand, West\_UP, Uttarakhand, Hry\_Chhd\_Delhi, Punjab, Himachal\_Pradesh, Jammu\_Kashmir, Odisha, SI\_Karnataka,
- Day1: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, West\_UP, Uttarakhand, Jammu\_Kashmir, Odisha, Chhattisgarh, Coastal\_AP,
- Day2: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, West\_UP, Uttarakhand, Hry\_Chhd\_Delhi, East\_RJ, Odisha, West\_MP, East\_MP, Vidarbha, Chhattisgarh, Coastal\_AP, Telangana,
- Day3: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, West\_UP, Jammu\_Kashmir, Odisha, East\_MP, Vidarbha, Chhattisgarh, Coastal\_AP, Telangana, Rayalseema, TN\_Puducherry, SI\_Karnataka,
- Day4: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, Himachal\_Pradesh, Jammu\_Kashmir, Odisha, East\_MP, Vidarbha, Chhattisgarh, Coastal\_AP, Telangana, Rayalseema.

## **7. K-Index :-> 35[Very Unstable thunderstorm likely]:**

### **Day/Index: Subdivision with Total Totals Index > 52**

- Day0: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Coastal\_AP, Telangana, Rayalseema, TN\_Puducherry, Coastal\_Karnataka, SI\_Karnataka, Kerala,
- Day1: Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, Odisha, Coastal\_AP, Rayalseema, TN\_Puducherry, SI\_Karnataka, Kerala,
- Day2: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Gangetic\_WB, Odisha, Coastal\_AP, Telangana, Rayalseema, TN\_Puducherry, Kerala,
- Day3: Gangetic\_WB, Jharkhand, East\_UP, Uttarakhand, Himachal\_Pradesh, Odisha, East\_MP, Chhattisgarh, Coastal\_AP, Telangana, Rayalseema, TN\_Puducherry, SI\_Karnataka, Kerala,
- Day4: Arunachal\_Pradesh, Sub\_Himalayan\_WB, Jharkhand, Uttarakhand, Himachal\_Pradesh, Jammu\_Kashmir, Odisha, East\_MP, Vidarbha, Chhattisgarh, Coastal\_AP, Telangana, Rayalseema, TN\_Puducherry, SI\_Karnataka.

## 8. Rainfall and thunder storm activity:

### Day/Index: Subdivisions with Precipitation > 2 cm

Day1: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB,

Day2: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Bihar, East\_UP, Odisha,

Day3: Assam\_Meghalaya, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar,

Day4: Gangetic\_WB, Jharkhand, Jammu\_Kashmir, Odisha, Chhattisgarh,

Day5: Odisha, Chhattisgarh, Coastal\_AP

### IMD GFS (T1534) based on 00UTC the day:

#### 1. Synoptic Systems:

The analysis based on 00 UTC North-South trough in lower troposphere extending from South East Uttar Pradesh extending southward and further south-westward up to south interior Karnataka across Madhya Pradesh and Vidharbha region it persists for next 72 hours forecast. The cyclonic circulation over north interior Karnataka and Telangana region has merged with the above trough. The analysis indicates the east-west trough from northern parts of Bangladesh to Manipur across Assam & Meghalaya it persists for next 3 days in forecast. The forecast shows a cyclonic circulation over north west Uttar Pradesh and adjoining areas in next 24 Hours, the 24 hour forecast also shows another cyclonic circulation over East Uttar Pradesh and adjoining Bihar region moving south-westward in next 48 hour forecast. The analysis further indicates a cyclonic circulation over Orissa and adjoining areas.

#### 2. Location of Jet and Jet Core (>60kt) at 500hPa:

Although the presence of strong westerlies is found over east and northeast India but no jet core over the Indian region for the next 3 days.

#### 3. Low Level Vorticity {850hPa Positive Vorticity ( $>12 \times 10^{-1}/s$ ):

Mostly along the foothills of Himalayas from J&K, Himachal up to north eastern states on all 3 days. Also found in the vicinity of north-south trough over South East Uttar Pradesh extending southward up to south interior Karnataka.

#### 4. Spatial distribution of T-storm Initiation Index, Lifted Index, Total Total Index, CAPE, CIN and Sweat Index [High potential for thunderstorm]:

**T-Storm Initiation Index (> 3):** Higher than a value 3 over coastal areas of Gangetic West Bengal and Kolkata, Orissa, Bihar, Jharkhand, Andhra Pradesh, Telangana, Rayalaseema, Kerala, Karnataka, Tamil Nadu, parts of Gujarat, coastal Maharashtra, Konkan & Goa, Madhya Maharashtra, Marathawada, East Vidarbha adjoining Chhattisgarh, coastal areas along the east coast and west coast, extreme south peninsular India, NE states and parts of Uttar Pradesh on all 3 days; parts of East Madhya Pradesh, Vidarbha and some parts of south west Rajasthan on day 3; over some parts of west Madhya Pradesh from day 2 onwards; Maximum value of the index is seen over parts of Gujarat, part of west coast, Konkan and Goa, Karnataka, GWB, coastal Orissa, coastal Andhra Pradesh, Telangana, Tamil Nadu, Over parts of Assam, Tripura and adjoining area during all 3 days; over parts of Bihar, Jharkhand and East Vidarbha region on day 2 and 3.; some parts of east Uttar Pradesh and adjoining area from day 2 onwards.

**Lifted Index (< -2):** The threshold value of the index is below -2 over parts of Gujarat, Saurashtra region, coastal Andhra Pradesh, coastal Karnataka, Telangana, Rayalaseema, Konkan and Goa, Kerala, Tamil Nadu, southern part of west coast, coastal areas along the east coast, coastal Orissa, Chhattisgarh, GWB, Konkan and Goa, Bihar, Jharkhand, NE states on all 3 days; over parts of East Uttar Pradesh and adjoining Madhya Pradesh on day 2 and 3; over parts of west Uttar Pradesh on day 3; maximum negative value of the index less than -10 can be seen over parts of Bihar, Jharkhand, GWB and Kolkata and Orissa on day 2 and 3.

**Total Total Index (> 50):** Above threshold value is seen over most of the parts of India except NE states and extreme southern peninsular India during all three days.

**Sweat Index (> 300):** Greater than threshold value of index over Parts of J&K, NE states, GWB, coastal areas along the east coast and west coast, Gujarat, Himachal Pradesh, Uttarakhand, Foothills of Himalaya, Orissa, Andhra Pradesh, Kerala, Tamil Nadu, Konkan and Goa, Coastal Maharashtra, Karnataka, Bihar and Jharkhand, Chhattisgarh, Vidarbha, East and West Madhya Pradesh during all three days; over parts of southwest Rajasthan on day 3; over some parts of Haryana on day 1; Maximum value of the index greater than 800 is seen over GWB and Orissa on all 3 days; over parts of Bihar, Jharkhand, Assam, Tripura and adjoining area and east Uttar Pradesh on day 2 and 3; over some parts of coastal Andhra Pradesh on day 3.

**CAPE (> 1000):** Mostly in areas of southern peninsular India, along west coast and over east coast and coastal areas of GWB, Orissa, Andhra Pradesh, Telangana, Rayalaseema, Kerala, Tamilnadu, Karnataka, Konkan and Goa, Gujarat and coastal Maharashtra, south Maharashtra and Vidarbha, Bihar, Jharkhand and NE states during all 3 days; over parts of East Uttar Pradesh and adjoining Madhya Pradesh from day 2 onwards; Maximum value of the index can be seen mostly over coastal areas along the east coast from GWB to southern parts of coastal Tamil Nadu during all 3 days; over parts of Bihar, Jharkhand, East Uttar Pradesh, Orissa, Andhra Pradesh on day 2 and 3.

**CIN (50-150):** Mostly over parts of Gujarat, along east coast along west coast from Saurashtra & Kutch to coastal Karnataka, Konkan and Goa, coastal Orissa, Telangana, Rayalaseema, Andhra Pradesh and GWB and NE states, Bihar, Jharkhand, East Uttar Pradesh and adjoining area during all 3 days. Over parts of Himachal Pradesh and adjoining area on day 2; over parts of South west Rajasthan, east Madhya Pradesh and adjoining Vidarbha on day 3.

## **5. Rainfall Activity:**

40-70 mm Rainfall; over parts of Assam and adjoining area on day2; over parts of GWB and Kolkata on day3

10- 40 mm rainfall: over parts of Arunachal Pradesh, Sikkim, Assam, Tripura, Meghalaya, Nagaland and adjoining, Kerala, Tamil Nadu and south Karnataka area during all 3 days; over parts of on day 2 and 3; over GWB and Kolkata on day 2 and 3.

Up to10 mm rainfall: Over NE states, Foothills of Himalaya, East Uttar Pradesh, Bihar, Jharkhand, Andhra Pradesh, Kerala, Tamil Nadu, Telangana, Rayalaseema, Orissa, Chhattisgarh, during all 3 days; over parts of J&K, Himachal Pradesh, Uttarakhand adjoining west Uttar Pradesh and East Madhya Pradesh on day 1 and 2; over Parts of GWB and Kolkata on day 2 and 3.



## IMD WRF (9km based on 00UTC of the day):

### **1. Model Reflectivity (Max.dBz):**

**> 25 dBZ Model Reflectivity:** Over parts of J&K and south interior Karnataka region on day 1 and 2; over parts of Assam, Meghalaya, Tripura, Mizoram, Sikkim, Arunachal Pradesh and adjoining area on all 3 days; over parts of East Uttar Pradesh and Bihar, Jharkhand, GWB and Kolkata, Orissa and Foothills of Himalaya on day 2 and 3; maximum value of the Model reflectivity greater than 50 dBZ can be seen on day 3 over parts of Bihar, Jharkhand, East Uttar Pradesh Assam, Tripura and adjoining area and some parts of Arunachal Pradesh.

### **2. Spatial distribution of Total Total Index, K-Index, CAPE and CIN [High potential for thunderstorm]:**

**Total Total Index (> 50):** Above threshold value is observed over most parts of the country except south peninsular India, along southern part of east coast and west coast and NE states on day 1 and 2; and over parts of Uttarakhand, East and West Uttar Pradesh and Bihar on day 3; maximum value of the index is seen over parts of J&K, Rajasthan, Punjab, Haryana, Delhi, Himachal Pradesh and adjoining Madhya Pradesh, Vidarbha, region on all 3 days; over parts of Chhattisgarh, Vidarbha region, Bihar, Jharkhand, Orissa, GWB, Andhra Pradesh, Karnataka, Telangana, Madhya Maharashtra and Marathwada region on day 2 and 3.

**K-Index (> 35):** Less than threshold value is observed over most of the part of the country during the next 3 days

**CAPE (> 1000):** Greater than threshold value over parts of Gujarat, coastal areas of southern part of west coast, coastal Maharashtra, Konkan and Goa, coastal areas along the east coast, coastal Orissa, GWB, Assam, Tripura, Arunachal Pradesh, Meghalaya and adjoining areas, parts of Tamil Nadu, Kerala, Andhra Pradesh, Uttar Pradesh, Bihar, Jharkhand, Chhattisgarh, Telangana, Rayalaseema and Extreme south peninsular India during all 3 days; over parts of J&K on day 1; over Parts of Vidarbha and Madhya Pradesh from day 2 onwards; Maximum value of the index is seen over the parts of Orissa and its coastal areas, coastal Andhra Pradesh and GWB and Kolkata, over east coast from Orissa to Tamil Nadu on all 3 days; over parts of Telangana, Andhra Pradesh, coastal Maharashtra, Konkan and Goa on day 1 and 2; over Parts of Bihar, Jharkhand, Kerala and Tamil Nadu on day 2 and 3.

**CIN (50-150):** Over coastal areas of east coast and west coast, GWB, parts of Orissa, Jharkhand and adjoining Bihar region, Jharkhand, Uttar Pradesh, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Coastal Maharashtra, Konkan and Goa, Telangana, Rayalaseema, and NE states on all 3 days; over Parts of Madhya Pradesh, Vidarbha Chhattisgarh from day 2 onwards; over some Parts of Himachal Pradesh, Haryana and Punjab on day 1; over some parts of Haryana, Delhi and adjoining areas on day 3..

### **3. Rainfall and thunderstorm activity:**

Above 130 mm Rainfall: over some parts of Bihar on day3.

70- 130 mm Rainfall: over some parts of Bihar and adjoining East Uttar Pradesh on day 3.

40-70 mm Rainfall: over parts Arunachal Pradesh and South Interior Karnataka on day 1; over parts of East Uttar Pradesh and adjoining Bihar on day 2 and 3; over parts of GWB and Kolkata on day 3.

10- 40 mm Rainfall: Over parts of Kerala, Tamil Nadu, adjoining Karnataka region, Sikkim and NE states on all 3 days; over parts Bihar, Jharkhand and East Uttar Pradesh on day 2 and 3; over parts of Andhra Pradesh on day 1; over parts of Orissa on day 2.

Up to 10 mm Rainfall: Over parts of Uttarakhand, Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Telangana, Rayalaseema, Orissa, Bihar, Jharkhand, Chhattisgarh, GWB, NE states and foothills of Himalaya on all 3 days; over parts of Himachal Pradesh on day 1 and 2, over parts of East Uttar Pradesh on day 2 and 3.



### 3. IOP ADVISORY FOR 24 and 48Hrs:

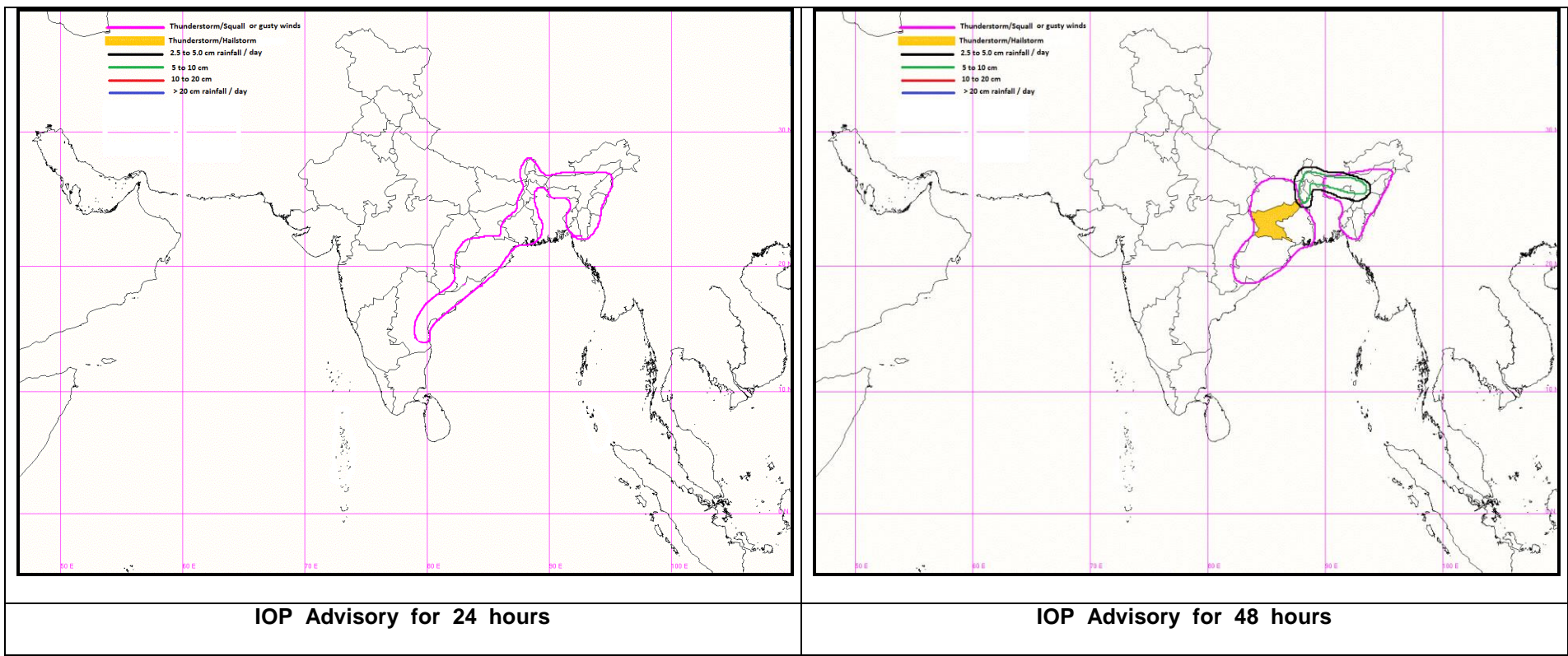
#### Summary and Conclusions:

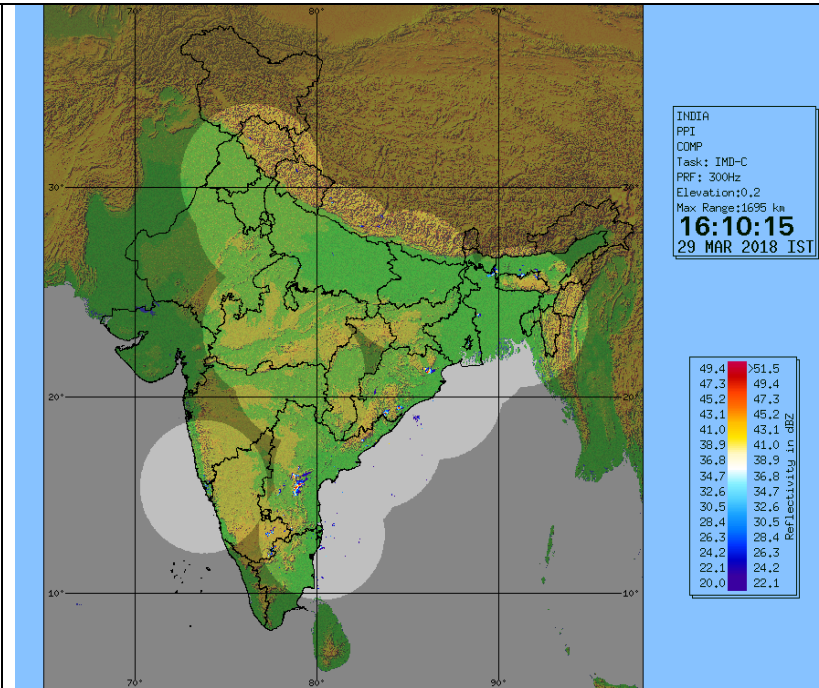
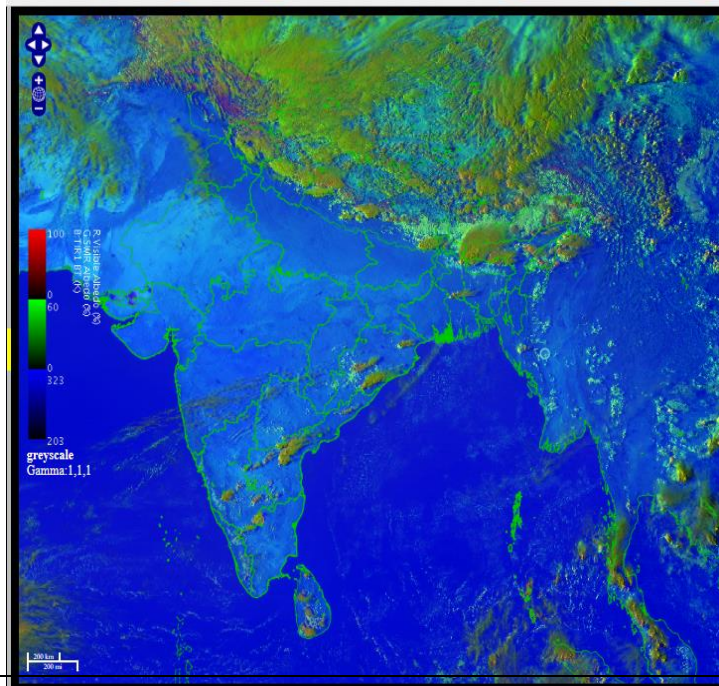
##### Day-1 & Day-2:

- Synoptic analysis indicates that an east west trough runs in the lower levels from northern parts of Bangla Desh to Manipur. Yesterday's low level cyclonic circulation over Gangetic West Bengal and adjoining Jharkhand is now seen over Odisha and neighbourhood at 0.9 km a.s.l. At the same time, the remnant Western Disturbance as a trough is seen along Long.85°E to the north of Lat.27°N. It is likely to amplify further and provide the necessary upper level divergence over east and northeast India steadily during next 48 hours.
- The above combination is likely to provide moisture incursion towards sub-Himalayan west Bengal and West Assam today and over to Gangetic west Bengal and adjoining areas of eastern India during Day-2.
- Thunderstorm associated with gusty winds / squalls are likely over sub-Himalayan west Bengal & Sikkim, adjoining districts of Gangetic west Bengal and northern parts of Odisha, Assam & Meghalaya and Nagaland, Manipur, Mizoram and Tripura, today and tomorrow. Jharkhand and Bihar also need to be monitored for Thunderstorm developments for tomorrow.
- There is likelihood of heavy rains in a few districts of Sub-Himalayan west Bengal and west Assam tomorrow.

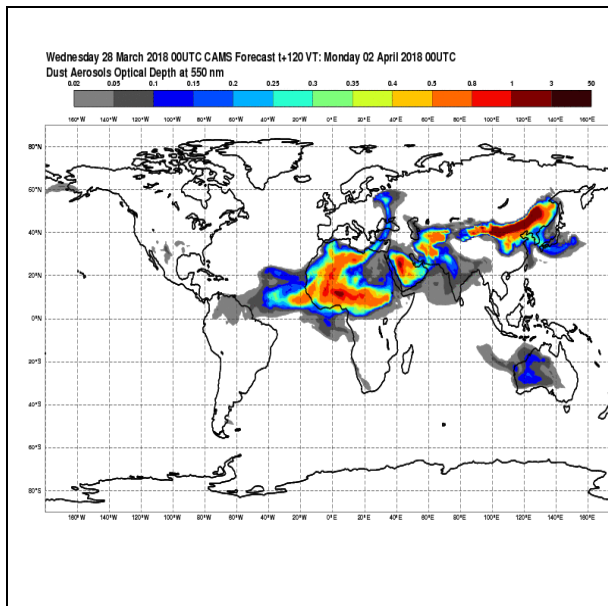
24 hour Advisory for IOP:	48 hour Advisory for IOP:
<b>Rainfall:</b> Nil	<b>Rainfall:</b> Sub-Himalayan West Bengal, West Assam
<b>Thunderstorm with associated phenomenon:</b> Sub Himalayan West Bengal & Sikkim Gangetic West Bengal, Odisha Assam and Meghalaya, Nagaland, Manipur, Mizoram and Tripura Coastal Andhra Pradesh	<b>Thunderstorm with associated phenomenon:</b> Gangetic West Bengal, Odisha, Jharkhand, Bihar Assam and Meghalaya, Nagaland, Manipur, Mizoram and Tripura

Graphical Presentation of Potential Areas for Severe Weather:

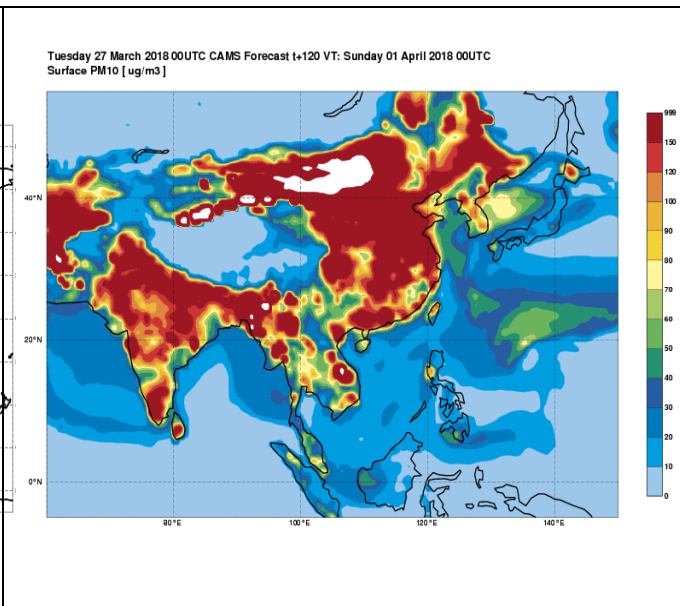




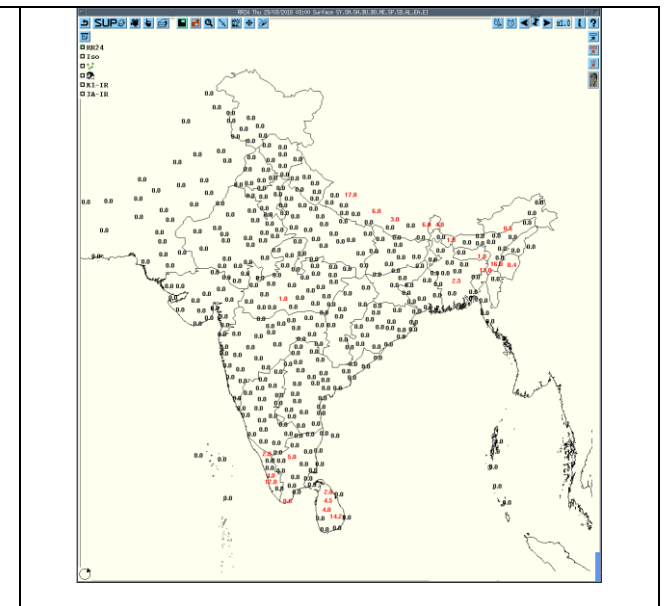




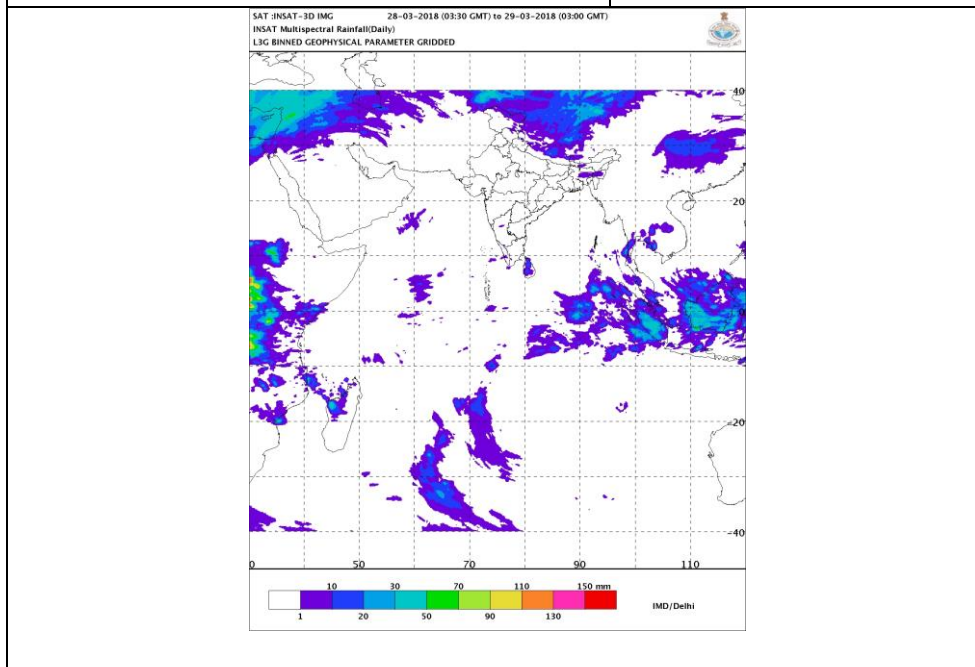
Forecast Dust Concentration



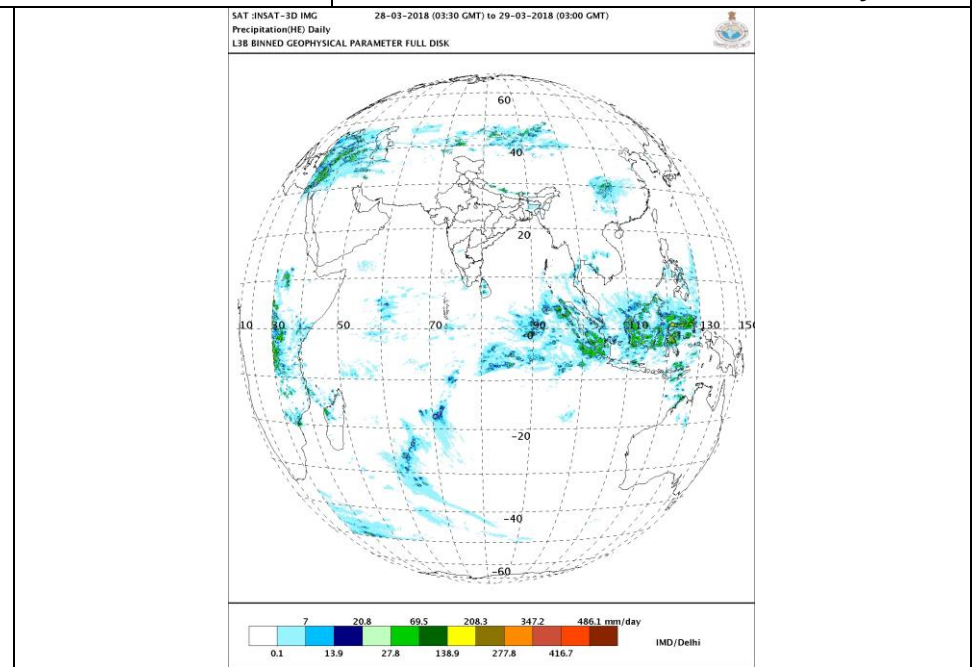
PM10 Forecast



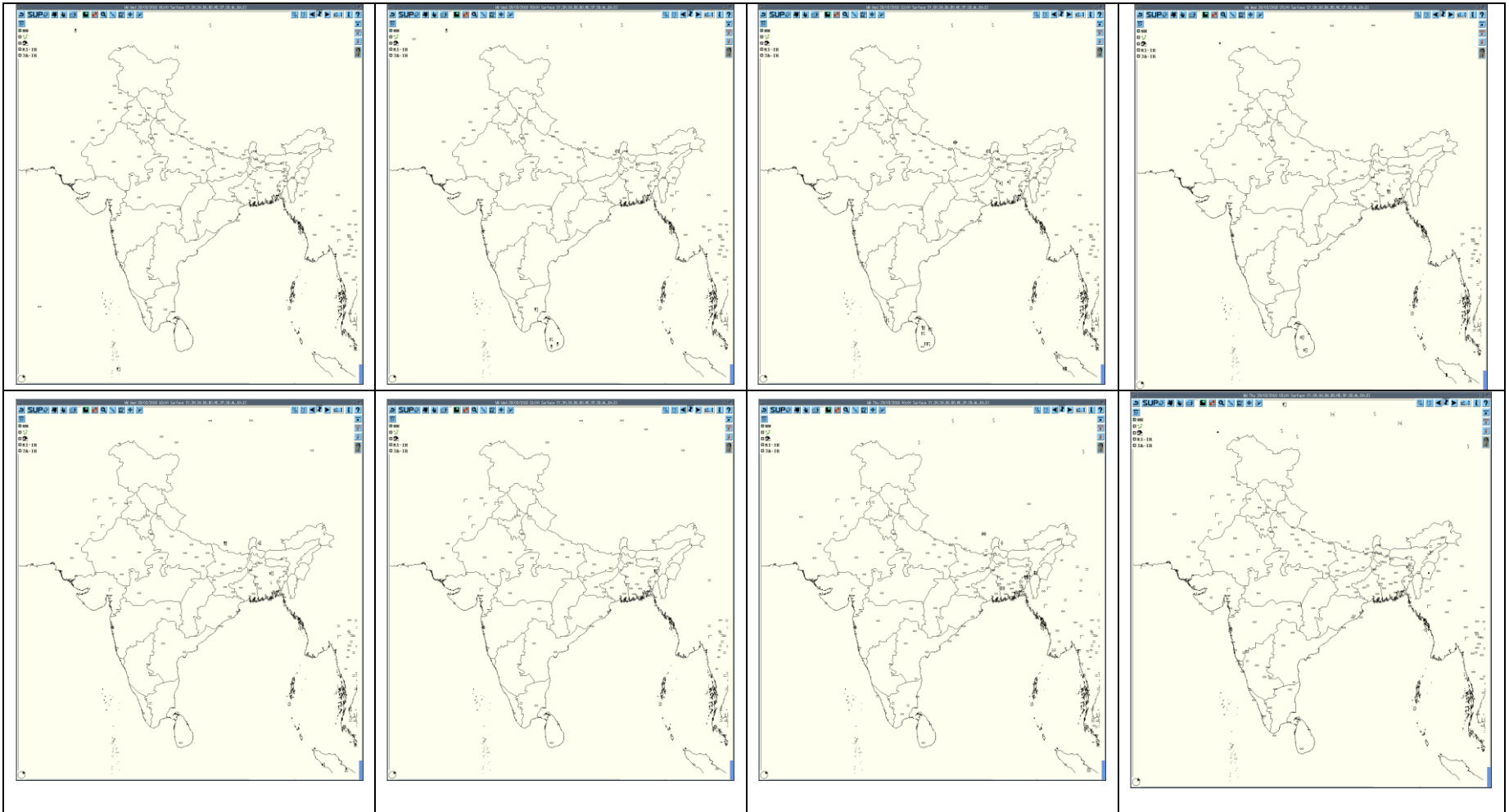
Accumulated 24 Hour rainfall (in red)  
recorded at 0300UTC of today



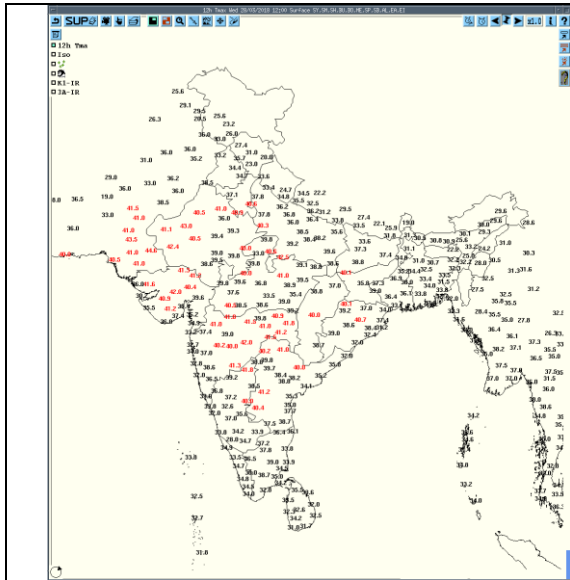
IMR



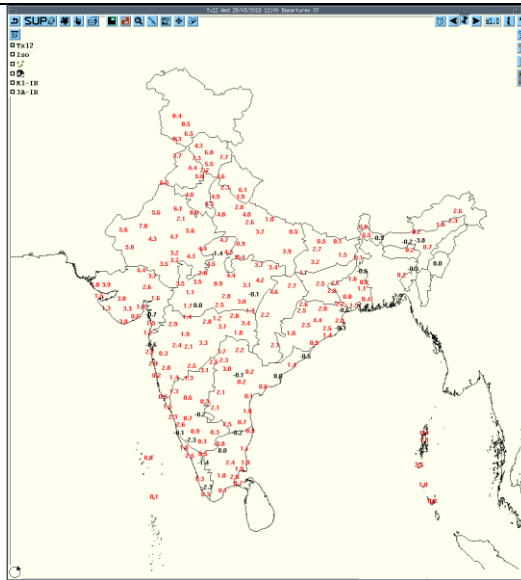
HEM



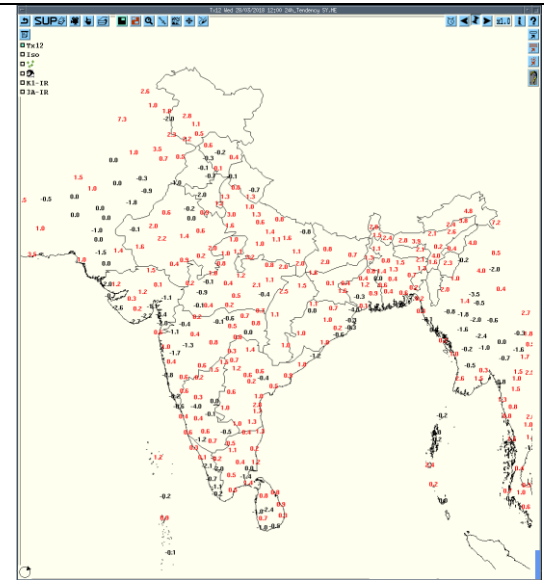
3hourly Past weather at 06, 09, 12, 15, 18, 21 UTC of yesterday and 00 & 03 hrs UTC of today



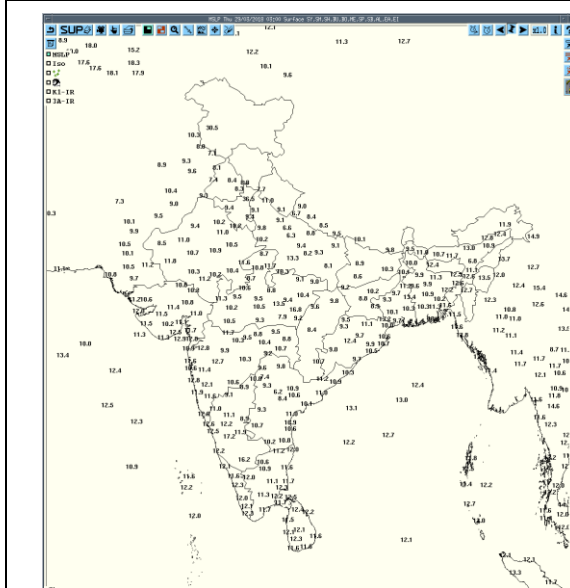
**Tmax**



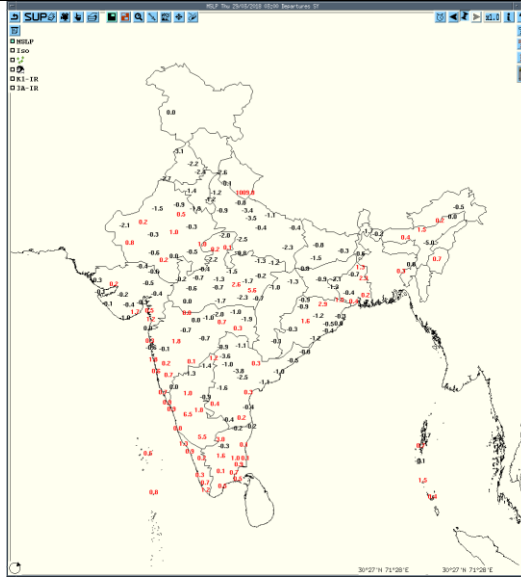
**Departure Tmax**



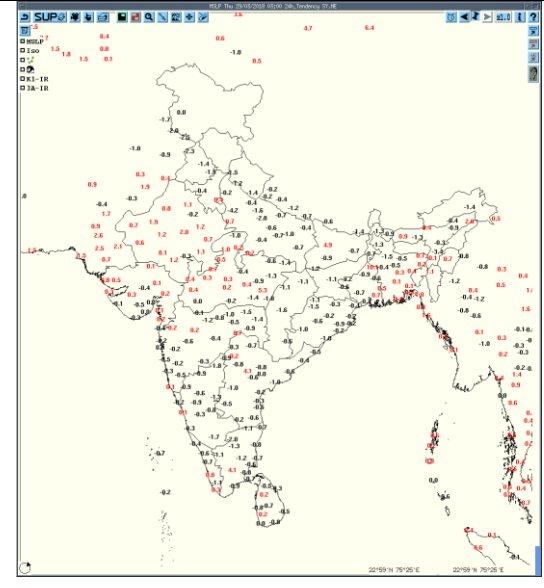
**Tendency Tmax**



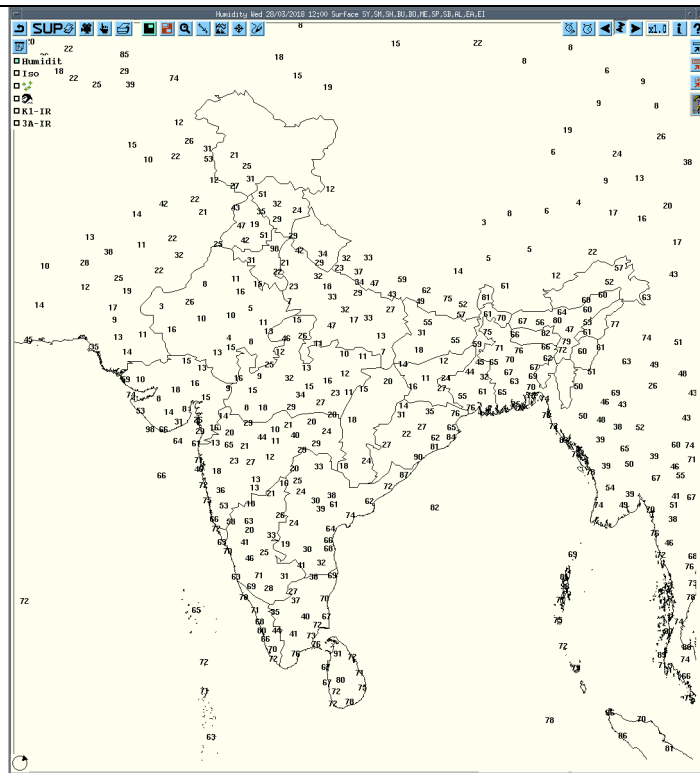
**MSLP**



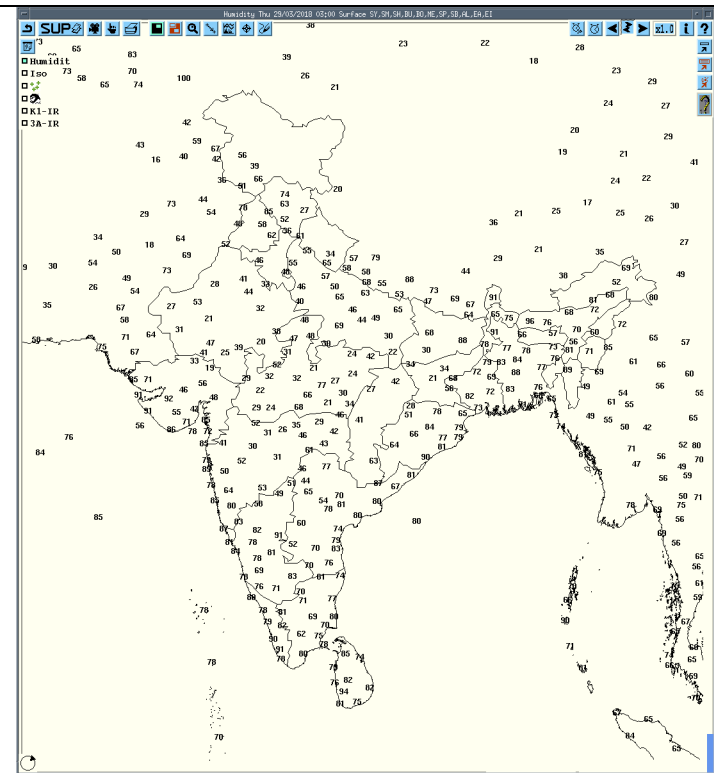
**Departure MSLP**



**Tendency MSLP**



RH at 12UTC yesterday



RH at 03UTC today



## Past 24 hours DWR Report:

DWR Station Name	Date of Report	Time Interval of Observation (UTC)	Organisation of cells (Isolated single cells/multiple cells/convective regions /squall lines) with height of 20 dBZ echo top and maximum reflectivity	Formation w.r.t. radar station and Direction of movement	Remarks	Associated Severe Weather if any	Districts affected
Patiala	29-03-18	280300-290300	No Echo	Nil	Nil	Nil	Nil
Lucknow	29-03-18	280300-290300	Nil	Nil	Nil	Nil	Nil
Jaipur	29-03-18	280300-290300	Nil	Nil	Nil	Nil	Nil
Visakhapatnam	29-03-18	280300-290300	Nil	Nil	Nil	Nil	Nil
Kolkata	29-03-18	280301-290300	Nil	Nil	No Significant Echo	Nil	Nil
Patna	29-03-18	280300-290210	NIL	N/A	N/A	N/A	N/A
		290210-290300	SINGLE Lat-26.27 Long.-86.04 Etop-4.8Km Max. Reflectivity-50 dBz	RANGE-122.6 Km STATIONARY	N/A	Thunderstorm	Darbhanga, Madhubani
Agartala	29-03-18	280300-290300* (*DWR operational from 0100-1400UTC)	Isolated single cell forming multiple cell over Meghalayan hills at 281112Z, 11KMS, 55Z	About 210 kms east of Meghalaya 30 KMPH , E-ly	Dissipated over Meghalayan hills at 281312Z	Not Known.	
			Isolated single cell forming multiple cell over Bangladesh at 281112Z, 11KMS, 55Z	About 200 kms ESE of Dhaka, 30 KMPH , ESE-ly	Dissipated over Bangladesh at 281312Z	Not Known.	
			Isolated single cell forming multiple cell over Bangladesh at 281202Z, 11KMS, 55Z kms,(radar non-operational due to no power from 281352z to 290135z)	About 230 kms ENE of Dhaka, 30 Kmph, ENE-ly	Persists over Bangladesh ENE of Dhaka	Not Known.	

**Realised past 24hrs TS/SQ/HS Data:**

Realised TS/HS/SQ during past 24 hours ending at 0300UTC of today(received from RMCs/MCs)						
Name of Station Reporting	Region	State/Sub Division	Weather Event (TS/Hail/Squall)	Date	Time of Commence ment (IST)	Time of end (IST)
Kailasahar	Northeast India	Tripura	Thunderstorm	29-03-18	0400	0610
Silchar	Northeast India	Assam	Thunderstorm	29-03-18	0300	0600
Dhubri	Northeast India	Assam	Thunderstorm	29-03-18	0525	0600
Cherrapunjee	Northeast India	Meghalaya	Thunderstorm	29-03-18	0800	0830
Imphal	Northeast India	Manipur	Thunderstorm	29-03-18	0550	0720
Tadong	East India	Sikkim	Thunderstorm	29-03-18	0720	0740
Kottayam	South India	Kerala	Thunderstorm (based on SYNERGIE data)	28-03-18	--	--

## IMPORTANT LINKS:

For NCMRWF NWP products:(<http://www.ncmrwf.gov.in/HomePage/NEPS-prod-1.php>)

For IMD NWP products:([http://nwp.imd.gov.in/diagpro\\_new.php](http://nwp.imd.gov.in/diagpro_new.php))

For Synoptic plotted data and charts

<http://amssdelhi.gov.in/>

<http://www.amsskolkata.gov.in/>

For RANDHRA PRADESHID tool:

[http://rAndhra\\_Pradeshid.imd.gov.in/](http://rAndhra_Pradeshid.imd.gov.in/)

Low Level Winds

[http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/LLW/MAR\\_2017/?C=M;O=D](http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/LLW/MAR_2017/?C=M;O=D)

Upper level winds

[http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/HLW/MAR\\_2017/?C=M;O=D](http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/HLW/MAR_2017/?C=M;O=D)

Past24hourHEMandIMRRainfall(upto03UTCof today)

IMR: [http://satellite.imd.gov.in/img/3Ddaily\\_imr.jpg](http://satellite.imd.gov.in/img/3Ddaily_imr.jpg)

HEM: [http://satellite.imd.gov.in/img/3Ddaily\\_he.jpg](http://satellite.imd.gov.in/img/3Ddaily_he.jpg)

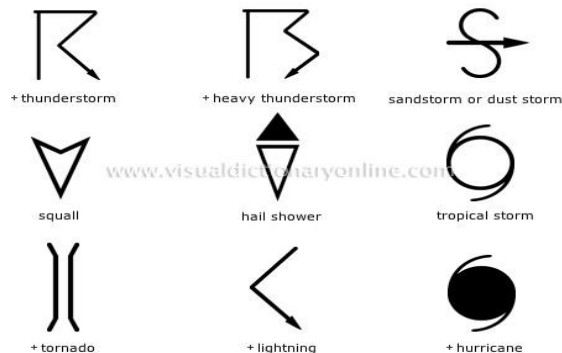
For Radar images of the past 24 hours including mosaic of images:

[http://ddgmui.imd.gov.in/dwr\\_img/](http://ddgmui.imd.gov.in/dwr_img/)

Satellite sounder based T- Phigram

[http://satellite.imd.gov.in/mAndhra\\_Pradesh\\_skm2.html](http://satellite.imd.gov.in/mAndhra_Pradesh_skm2.html)

## WEATHER SYMBOLS:



∞	haze
☁	smoke
☁	dust or sand storm
☁	fog
☁	drizzle
☁	rain
☁	snow
☁	showers
☁	hail
☁	thunderstorm
<b>Weather Symbols</b>	