



# India Meteorological Department

## FDP STORM Bulletin No. 48 (23-04-2018)

### 1. CURRENT SYNOPTIC SITUATION:

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

- ♦ The remnant Western Disturbance as a trough roughly along longitude 82°E to the north of latitude 25°N at 3.1 km above mean sea level persists.
- ♦ A fresh Western Disturbance is very likely to affect Western Himalayan region from 25th April.
- ♦ The cyclonic circulation over Sub-Himalayan West Bengal & neighbourhood now lies over West Assam & neighbourhood extending upto 0.9 km above mean level.
- ♦ The north-south trough now runs from the above cyclonic circulation to south Tamilnadu across Gangetic West Bengal, Odisha, Coastal Andhra Pradesh and Rayalaseema and extends upto 1.5 km above mean sea level.
- ♦ A cyclonic circulation extending upto 1.5 km above mean level lies over south Chhattisgarh and adjoining Odisha embedded in the above trough.
- ♦ The trough from North Interior Karnataka to Lakshadweep has merged with the above trough.

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

##### Current Observation (based on 0300UTC imagery of INSAT 3D):

##### Western Disturbance (WD):

Broken multi-layered clouds seen over South Caspian Sea, Iran & neighbourhood in association with Western Disturbance over the area.

##### Convective Activity:-

Convective cell over Lakshadweep and neighbourhood has weakened further.

##### Precipitation Nowcast Based on WMO Scope Product:-

Data indicate precipitation is likely to take place during next three (03) hrs over Lakshadweep.

##### Clouds descriptions within India:

Broken low/medium clouds with embedded moderate to intense convection seen over Lakshadweep. Scattered low/medium clouds with embedded weak convection seen over South Odisha, Arunachal Pradesh and Northeast Assam. Scattered low/medium clouds with embedded isolated weak convection seen over South Interior Karnataka. Scattered low/medium clouds seen over rest Assam, Nagaland and Chhattisgarh. Isolated

low/medium clouds seen over North Coastal Andhra Pradesh, Kerala, Tamilnadu, and North Karnataka. No significant clouds over North and West India.

**Arabian Sea:-**

Scattered low/medium clouds with embedded isolated moderate to intense convection seen over Southeast Arabian Sea.

**Bay of Bengal & Andaman Sea:**

Scattered low/medium clouds with embedded isolated moderate to intense convection are seen over West-central and South Bay south of lat 10.0deg N & South Andaman Sea.

**Past Weather:**

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

Moderate to Intense convection was observed over Lakshadweep Karnataka Kerala Rayalseema North Coastal Andhra Pradesh adjoining Chhattisgarh Extreme North-East Orissa Tripura (.)

**OLR:-**

Up-to  $250\text{wm}^{-2}$  observed over Jammu & Kashmir North Himachal Pradesh North Uttarakhand Sikkim Arunachal Pradesh & South Interior Karnataka South Kerala.

**Synoptic Features:**

**Westerly Trough:** Trough in Westerlies runs roughly along Longitude **85.0E** & north of Latitude **25.0N**.

**Dynamic Features:**

Up to 40- 80 knots **wind shear** is observed over North & Central India and 10-15 knots over south peninsula India.

**Negative Shear tendency** observed over J&K North-east States and Positive Shear tendency over rest parts of India

**Precipitation:**

**IMR:**

Rainfall up-to 20-50 mm observed over some South Coastal Karnataka South Interior Karnataka North Kerala

Rainfall up-to 01-20 mm observed over some parts of NE Jammu and Kashmir NE Orissa South Chhattisgarh adjoining Orissa Rayalseema Rest Kerala.

### **RADAR and RAPID RGB Observation:**

Isolate/multiple moderate echoes were seen on DWR Machilipatnam (max dBZ 50-55 and height around 13km), Kolkata (max dBZ 45-50 and height 10-12km), Gopalpur (max dBZ 45-50 and height around 15km), Chennai (max dBZ 50-55 and height 10-12km), Hyderabad (max dBZ 45-50 and height 10-12km) and Agartala (max dBZ 40-45 and height 7-8km) domains at around 1445 IST.

Convection appears to be in progress over Odisha in RAPID RGB Satellite imagery at 1330IST.

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

Higher Dust concentration was observed over northern Africa, Arab countries and western parts of India. Widespread higher concentration of dust is also observed over North India. Particulate matter concentration is expected to remain in moderate category for next 2 days in Delhi.

<b>Delhi – SAFAR analysis &amp; Forecast</b>	<b>23.04.2018</b>	<b>24.04.2018</b>
PM10 (micro-g/m <sup>3</sup> )	167	150
PM2.5 (micro-g/m <sup>3</sup> )	79	71

## **2. NWP MODEL GUIDANCE:**

### **NCMRWF (NCUM forecast based on 00UTC the day):**

#### **1. Weather Systems:**

##### **Low level Cycirs, Troughs:**

**00UTC of Day 1:** 850 hPa trough over Sub Himalayan WB and Bangladesh region

**00UTC of Day 1-4:** In Day 1-2, 850 hPa NE-SW trough from Odisha to southern Peninsular India with associated CYCIR over peninsular India. Day 3 trough from MP to southern peninsula

**Confluence & Wind Discontinuity Regions: 12 UTC of Day 0-1:** 925 hPa N-S discontinuity over Southern Peninsular India and in Day 0-2 SW-NE discontinuity over NI Karnataka & Telangana

**Synoptic Systems: 12 UTC of Day 0-2: 12 UTC of Day 0:** WD as a trough over J &K. A fresh WD approaching J&K in Day 2.

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

### 3. Convergence at 850 hPa:

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

Day0: Gangetic WB, Odisha, Chhattisgarh, NI Karnataka, SI Karnataka,

Day1: Jharkhand, Odisha, Madhya Maharashtra, Chhattisgarh, Telangana, NI Karnataka, SI Karnataka,

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Odisha, Madhya Maharashtra, Telangana, NI Karnataka, SI Karnataka,

Day3: NE NMMT, Gangetic WB, Jharkhand, Bihar, East Rajasthan, West MP, East MP, Madhya Maharashtra, Marathwada, Chhattisgarh, Telangana, NI Karnataka, SI Karnataka,

Day4: NE NMMT, Gangetic WB, Jharkhand, Jammu Kashmir, Odisha, Madhya Maharashtra, Chhattisgarh, Tamilnadu,, Puducherry, NI Karnataka, SI Karnataka, Kerala,

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

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

Day0: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Himachal Pradesh,

Day1: Arunachal Pradesh, Assam Meghalaya, Gangetic WB, Jharkhand, Himachal Pradesh, Telangana,

Day2: NE NMMT, Uttarakhand, Odisha,

Day3: Gangetic WB, Bihar, East UP, West UP, Jammu Kashmir,

Day4: Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, Coastal AP, NI Karnataka

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

#### Day/Index: Subdivisions with Showalter Index $< -4$

Day0: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Jammu Kashmir, Odisha, Coastal AP, Rayalseema, Tamilnadu,, Puducherry, Coastal Karnataka, SI Karnataka, Kerala,

Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Tamilnadu,, Puducherry, SI Karnataka, Kerala,

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Coastal AP, Tamilnadu,, Puducherry, SI Karnataka, Kerala,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Coastal AP, Tamilnadu,, 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, Tamilnadu,, Puducherry, SI Karnataka, Kerala,

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

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

Day0: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Vidarbha, Chhattisgarh, Telangana, Rayalseema, SI Karnataka,  
Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalseema,  
Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Bihar, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha,  
Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Vidarbha, Chhattisgarh, Coastal AP,  
Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha, Coastal AP

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

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

Day0: Arunachal Pradesh, Sub Himalayan WB, Gangetic WB, Odisha, Chhattisgarh, Coastal AP, Telangana, Rayalseema, Tamilnadu,, Puducherry, Coastal Karnataka, SI Karnataka, Kerala,  
Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalseema, Tamilnadu,, Puducherry, SI Karnataka,  
Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Coastal AP, Rayalseema, Tamilnadu,, Puducherry, SI Karnataka, Kerala,  
Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Jharkhand, Bihar, Uttarakhand, Jammu Kashmir, Odisha, Coastal AP, Telangana, Rayalseema, Tamilnadu,, Puducherry, SI Karnataka, Kerala,  
Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Bihar, East UP, Uttarakhand, Jammu Kashmir, Odisha, Tamilnadu,, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala

## 8. Rainfall and thunder storm activity:

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

Day1: Arunachal Pradesh,  
Day2: Arunachal Pradesh, Assam Meghalaya, Gangetic WB, Odisha, Coastal AP,  
Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Jammu Kashmir, Kerala,  
Day4: Assam Meghalaya, NE NMMT, Sub Himalayan WB, Jammu Kashmir, Tamilnadu,, Puducherry,  
Day5: Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jammu Kashmir

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

### **1. Synoptic Systems:**

The analysis based on 00 UTC indicates a cyclonic circulation over west Assam and adjoining areas in lower troposphere (925hPa). The analysis also indicates a North-South Trough extending from the above cyclonic circulation up to south Tamil Nadu across Gangetic west Bengal, Orissa, coastal Andhra Pradesh and Rayalaseema. The forecast shows it will persist for next 48 hours. The forecast shows a cyclonic circulation over south Chhattisgarh and adjoining Orissa on day1. It will become less marked on day4. The forecast shows a trough over Punjab and adjoining north Rajasthan on day3.

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

Although the presence of strong westerlies is found over northern parts of India, east and northeast India but no jet core over the Indian region for the next 2 days

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

Low level Positive Vorticity is seen mostly along the foothills of Himalaya, NE states and along the north-south trough from Assam, GWB to south Tamil Nadu for next 2 days. It is inferred that J&K, Himachal Pradesh and Uttarakhand has Positive Vorticity on day 1 and Punjab, Himachal Pradesh, Uttarakhand, Haryana and adjoining West Uttar Pradesh has Positive Vorticity from day 3 onwards

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

The threshold value of the index  $> 3$  is seen over coastal areas of Gangetic West Bengal and Kolkata, parts of Orissa, Bihar, Jharkhand, Andhra Pradesh, Telangana, Rayalaseema, Kerala, Karnataka, Tamil Nadu, parts of Gujarat, coastal Maharashtra including Mumbai, Konkan & Goa, Vidarbha, Chhattisgarh, coastal areas along the east coast and west coast, Sikkim, Assam, Meghalaya, Tripura and adjoining area, SHWB on all 3 days; over parts of East Uttar Pradesh and west Rajasthan on day 3; Maximum value of the index is seen over parts of GWB, Orissa, Andhra Pradesh, coastal Maharashtra and coastal Tamil Nadu on all 3 days; over parts of south Chhattisgarh, Telangana, coastal Karnataka on day 1; over parts of Konkan and Goa, Jharkhand and Karnataka on day 2; over parts of East Uttar Pradesh, Bihar, Jharkhand, south Chhattisgarh, south west Rajasthan, Gujarat, Konkan and Goa, Karnataka, Assam Tripura and adjoining areas on day 3.

**Lifted Index ( $< -2$ ):** The threshold value of the index is below  $-2$  over parts of Andhra Pradesh, Karnataka, Telangana, Rayalaseema, Konkan and Goa, Kerala, Tamil Nadu, southern part of west coast, coastal areas along the east coast, Chhattisgarh, Bihar, Jharkhand, Vidarbha, Orissa, GWB, SHWB, Sikkim, Assam, Meghalaya, Mizoram, Nagaland, Tripura and adjoining areas on all 3 days; over parts of Gujarat and East Uttar Pradesh on day 3; maximum negative value of the index less than  $-10$  is seen over parts of Orissa, Jharkhand and GWB on day 2 and 3; over parts of SHWB, Tripura and adjoining areas on day 3.

**Total Total Index ( $> 50$ ):** The threshold value of the index is  $> 50$  is seen over most of the parts of country except Extreme south peninsular India and NE states during next 3 days; maximum value of the index  $>60$  is seen over parts of Punjab, Himachal Pradesh, Uttarakhand, Gujarat,

Rajasthan, Haryana, Delhi, Madhya Pradesh, Bihar, Jharkhand, Orissa, Chhattisgarh, Vidarbha, Uttar Pradesh, Telangana, Madhya Maharashtra, Marathwada, Karnataka and SHWB during next 3 days; over parts of J&K on day 3.

**Sweat Index (> 300):** Although the threshold value of the Index >300 is seen in most parts of the country except central parts of Madhya Pradesh, Northern parts of Rajasthan, Punjab, Haryana, Delhi, Uttar Pradesh, northern parts of Chhattisgarh and west Vidarbha during next all 3 days; maximum value of the index greater than 800 is seen over parts of SHWB, GWB, Orissa and Jharkhand on day 2; over parts of Orissa, adjoining GWB, Bihar, Jharkhand, SHWB, Tripura and adjoining areas on day 3.

**CAPE (> 1000):** Mostly in areas of southern peninsular India, along west coast and east coast, parts of Orissa, Andhra Pradesh, Telangana, Rayalaseema, Kerala, Tamil Nadu, Karnataka, coastal Maharashtra including Mumbai, Konkan and Goa, Jharkhand, Chhattisgarh, GWB, SHWB, Sikkim, Assam, Meghalaya, Tripura and adjoining areas during next 3 days; over parts of Bihar, Gujarat and East Uttar Pradesh on day 3; Maximum value of the index greater than 2500 is seen mostly over parts of GWB, coastal Orissa, coastal Andhra Pradesh, Coastal Tamil Nadu, coastal Kerala and coastal Karnataka during next 3 days; over parts of Bihar, Jharkhand, Tripura and adjoining areas on day 3.

**CIN (50-150):** Although the threshold value of the Index lies in the range of (50–150) over most part of the country except Punjab, east Rajasthan, Madhya Pradesh, west Vidarbha, Madhya Maharashtra, Marathwada, Himachal Pradesh, Uttarakhand, Haryana, Delhi, Uttar Pradesh, north Chhattisgarh during all 3 days; maximum value of the index greater than 400 is seen over parts of Gujarat and south coastal Maharashtra on day 2; over parts of Gujarat, southwest Rajasthan and south coastal Maharashtra on day 3.

## **5. Rainfall Activity:**

40-70 mm Rainfall: over some parts of Orissa and Gangetic West Bengal on day 1

10- 40 mm Rainfall: over parts Kerala, Assam, Arunachal Pradesh and adjoining areas during next 3 days; Over parts of Orissa on day 1 and 2; over parts of GWB and Andhra Pradesh on day 1; over parts of Tamil Nadu on day 2 and 3; over some parts of Sikkim on day 3.

Up to 10 mm rainfall: Over parts of J&K, Foothills of Himalaya, Himachal Pradesh, Uttarakhand, Sikkim, NE states, Orissa, Bihar, Jharkhand, GWB, SHWB, Chhattisgarh, Andhra Pradesh, Kerala, Karnataka, Tamil Nadu, Telangana, Rayalaseema during next 3 days; over parts of East Vidarbha on day 1 and 2; over some parts of Punjab on day 3.

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

**1. Model Reflectivity (Max. dBZ): > 25 dBZ Model Reflectivity:** Over parts of GWB, Orissa, Kerala, Tamil Nadu, J&K, south Chhattisgarh, Andhra Pradesh, Assam, Arunachal Pradesh and adjoining areas on day 1; over parts of Telangana, Andhra Pradesh, Assam, Arunachal Pradesh, Meghalaya, Tripura and adjoining areas, GWB and Orissa on day 2 on day 2; over parts of Sikkim, most of NE states SHWB and adjoining areas on day 3 and maximum value of the Model reflectivity is seen over parts of Orissa and GWB on day 1; over Sikkim and NE states on day 3.

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

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

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

**CAPE (> 1500):** Greater than threshold value over parts of coastal areas of west coast, coastal Maharashtra, Konkan and Goa, coastal areas along the east coast, southern parts of Madhya Maharashtra, Vidarbha, Bihar, Jharkhand, Chhattisgarh, Orissa, GWB and Kolkata, SHWB, parts of Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Telangana, Rayalaseema, Extreme south peninsular India and NE states on all 3 days; over some parts of East Uttar Pradesh and Gujarat on day 3; Maximum value of the index greater than 3500 is seen over the parts of Karnataka, coastal Kerala, coastal Orissa, coastal Andhra Pradesh, GWB, SHWB, coastal Tamil Nadu, Telangana on day 1; over parts of GWB, coastal Orissa, coastal Andhra Pradesh, Karnataka, Konkan and Goa, Kerala and Jharkhand on day 2 and 3.

**CIN (50-150):** Although the threshold value of the Index lies in the range of (50–150) over most part of the country except Punjab, Himachal Pradesh, Uttarakhand, Haryana, Delhi, Madhya Pradesh, north Chhattisgarh, west Vidarbha, North Madhya Maharashtra and Marathwada during next 3 days; the maximum value of the index > 400 is seen over J&K, coastal Gujarat, Jharkhand, GWB, SHWB, Orissa, Chhattisgarh, Coastal Maharashtra on day 1 and 2; over parts of Bihar, Jharkhand, Uttar Pradesh, Gujarat, coastal Maharashtra, Orissa, GWB, Chhattisgarh, Telangana, Andhra Pradesh and south west Rajasthan on day 3.

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

40-70 mm Rainfall: over parts of GWB and Orissa on day 1; over parts of Assam and Arunachal Pradesh on day 2.

10- 40 mm Rainfall: over parts of Sikkim, SHWB, Kerala, Karnataka, Tamil Nadu and NE states during next the 3 days; over parts of GWB, Orissa and Andhra Pradesh on day 1; over parts of Orissa on day 2.

Up to 10 mm Rainfall: Over parts of J&K, Himachal Pradesh, Uttarakhand, foothills of Himalaya, Kerala, Tamil Nadu, Karnataka, Orissa, GWB, Andhra Pradesh, Telangana, Rayalaseema, Sikkim, SHWB and NE states during next 3 days. Over parts of Chhattisgarh on day 1 and 2; over parts of east Vidarbha on day 1; over parts of Bihar and Jharkhand on day 3.



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

#### Summary and Conclusions:

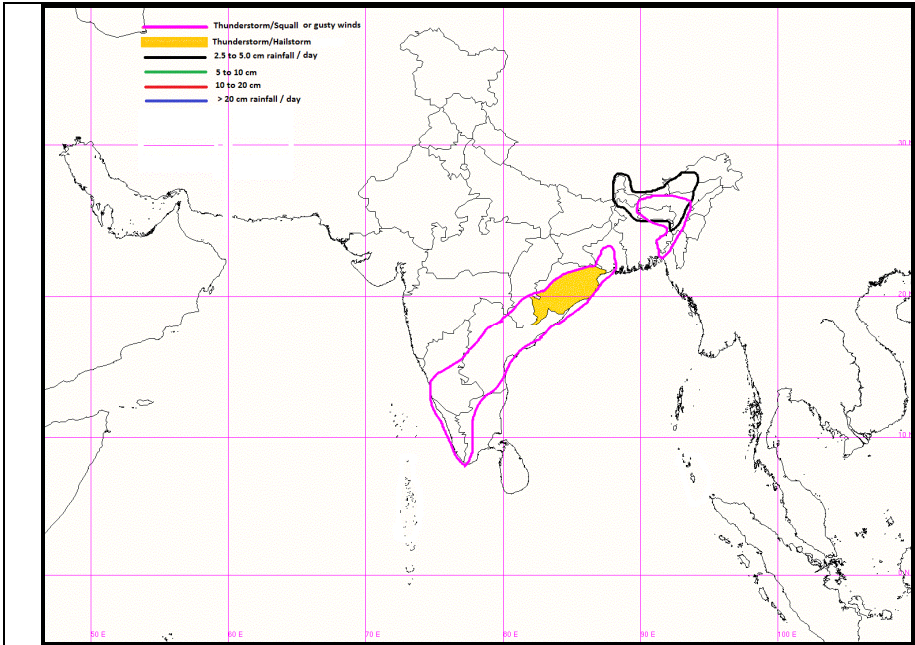
O Most thermodynamic indices (T-STORM Initiation Index, K-Index, Lifted Index, CAPE, CINE) from IMD GFS deterministic model indicate high probability of thunderstorm occurrence along the east and south peninsular coast of India on day 1 and 2. SWEAT index, which also accounts for the wind shear between 850 and 500hPa levels, indicates a maximum probability of thunderstorms over West Bengal and coastal Odisha on day1, increasing on day2 over the same region. Reflectivity values from IMD WRF model indicate high probability of convection over west Assam and Meghalaya on day2. The 850-200hPa wind shear is very high over central India on day1 and day2.

O Synoptic analysis and NWP models indicate that there is a northeast – southwest oriented trough in the lower levels, extending from a cyclonic circulation over Sub-Himalayan West Bengal & neighbourhood to south Tamilnadu, with an embedded cyclonic circulation over south Chhattisgarh and adjoining Odisha. The anticyclone over the Bay of Bengal is active and is pumping moisture to the east of the trough. This is likely to result in thunderstorms all along the east coast of India and Northeast India on day 1. On day 2, the thunderstorms are likely to be confined over the same region.

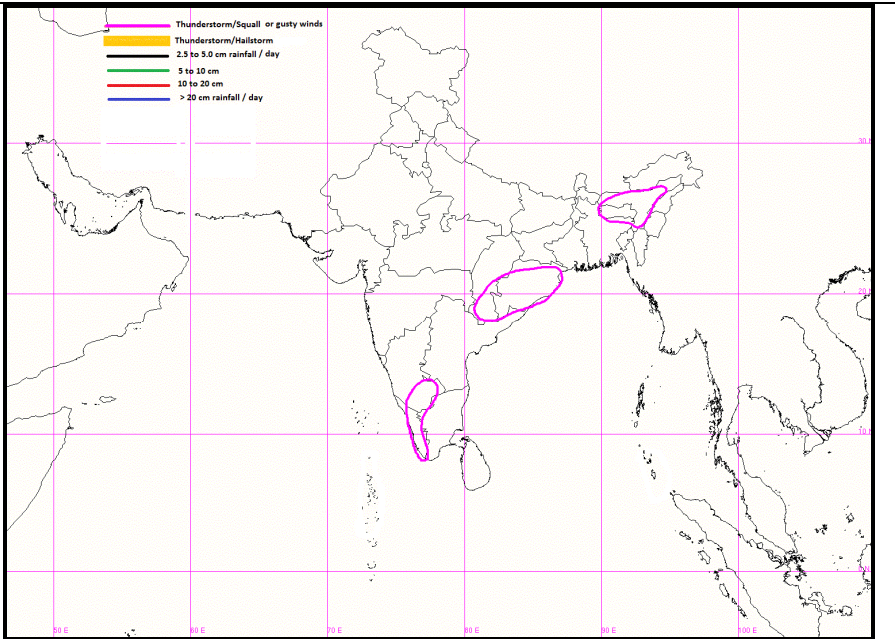
#### Day-1 & Day-2:

24hour Advisory for IOP:	48hour Advisory for IOP:
<b>Significant Rainfall:</b> South and west Assam and Meghalaya, Arunachal Pradesh Sub Himalayan West Bengal and Sikkim,  <b>Thunderstorm with squall or gusty winds:</b> Interior Tamil Nadu, Kerala, South Interior Karnataka, Coastal Karnataka, Rayalseema, East Telangana, Coastal Andhra Pradesh, Chhattisgarh, West Gangetic West Bengal Tripura, South and west Assam and Meghalaya  <b>Thunderstorm with squall and hail</b> Odisha  <b>Thunderstorm/Duststorm:</b> Nil	<b>Significant Rainfall:</b> Nil  <b>Thunderstorm with squall or gusty winds:</b> Kerala, South Interior Karnataka, Chhattisgarh, Odisha Assam and Meghalaya  <b>Thunderstorm with squall and hail</b> Nil  <b>Thunderstorm/Duststorm:</b> Nil

Graphical Presentation of Potential Areas for Severe Weather:

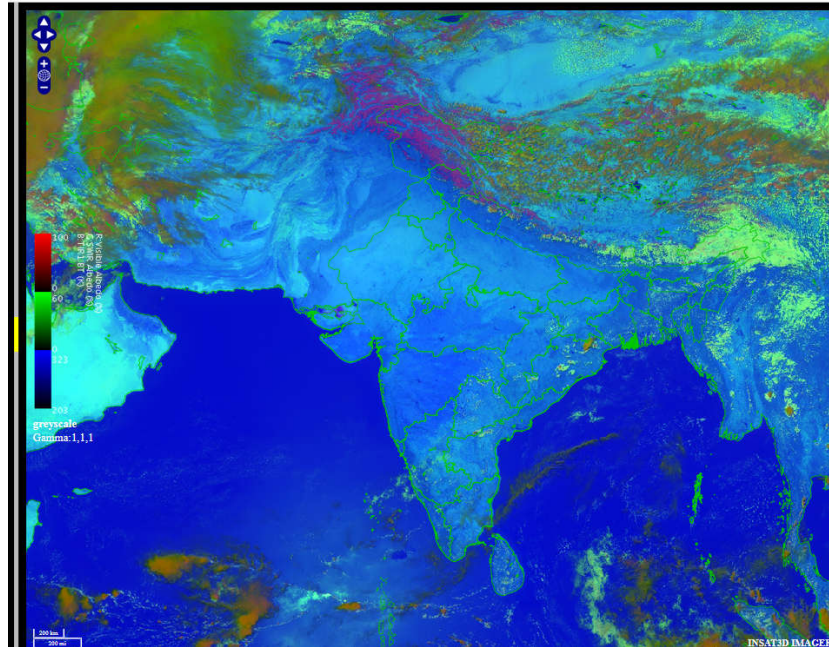


IOP Advisory for 24 hours

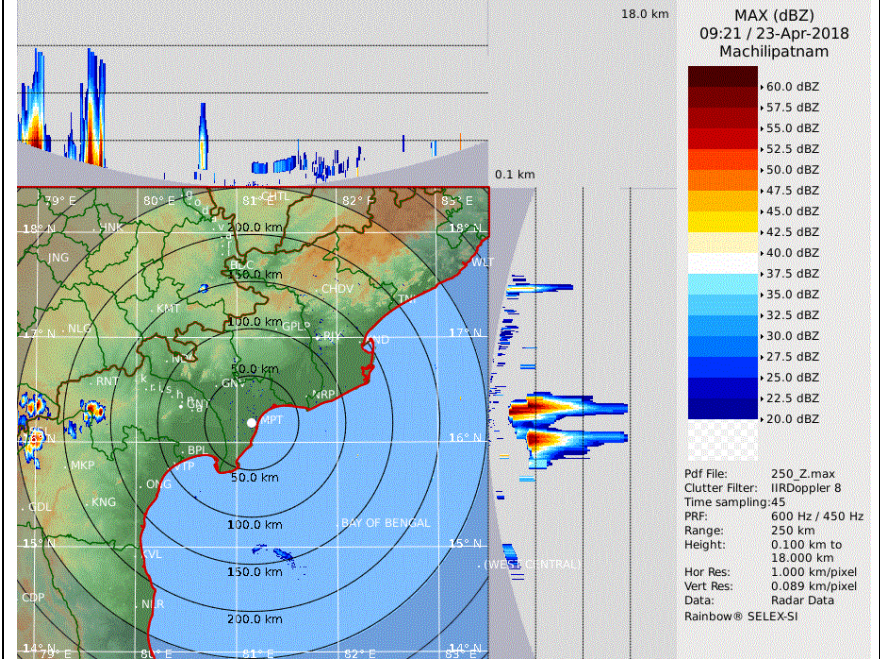


IOP Advisory for 48 hours

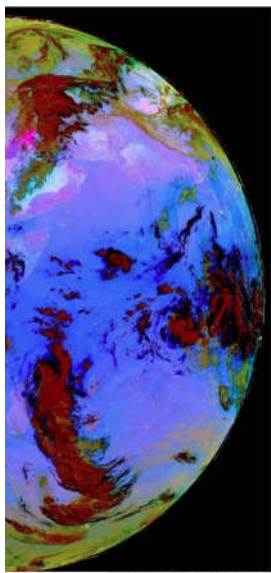




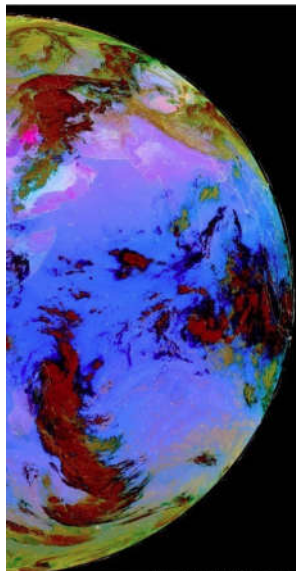
**RAPID RGB Imagery at 1330 IST of the Day**



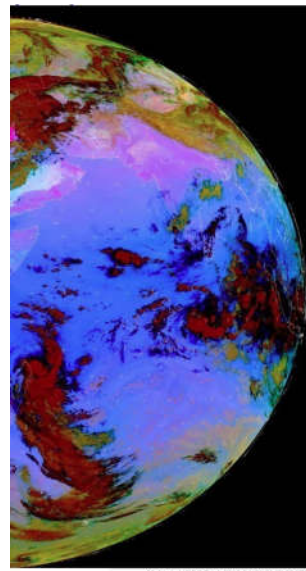
**DWR Machilipatnam at 1451 IST of the Day**



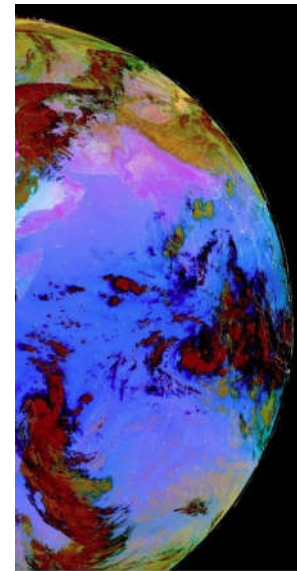
Meteosat-10/10C Dust, 2018-04-23 11:00:00 UTC



Meteosat-10/10C Dust, 2018-04-23 02:00:00 UTC



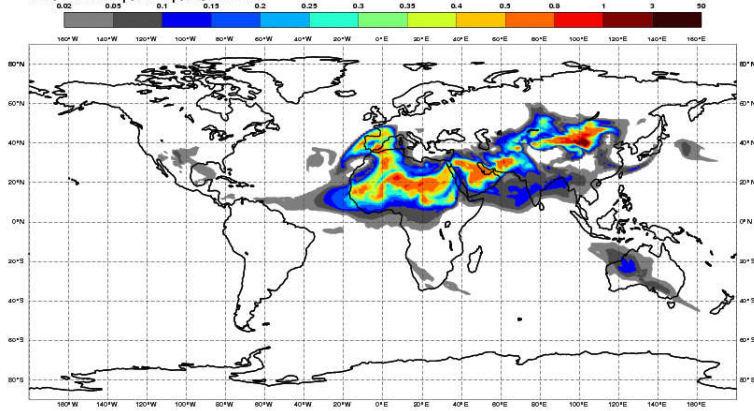
Meteosat-10/10C Dust, 2018-04-23 01:00:00 UTC



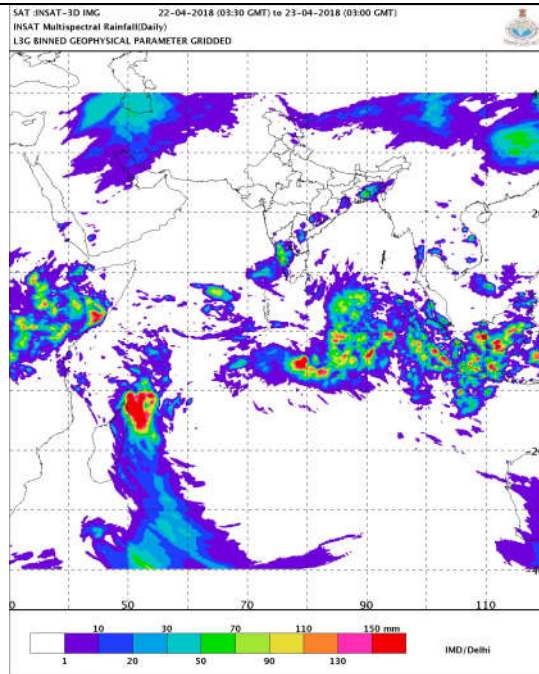
**Observed Satellite Dust Images on 23-04-2018**



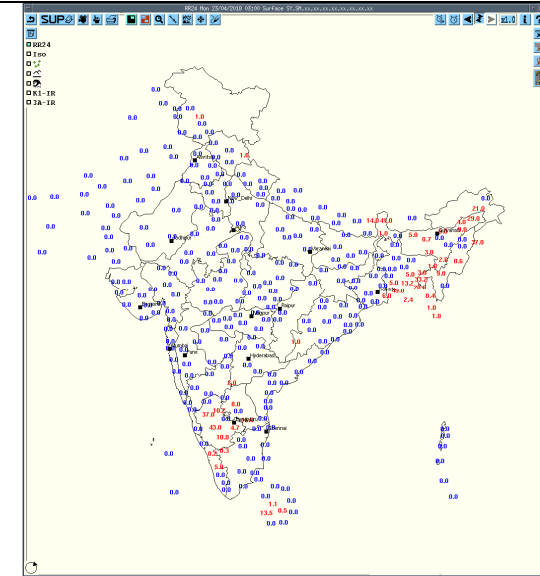
Friday 20 April 2018 00UTC CAMS Forecast 1-120 VT: Wednesday 25 April 2018 00UTC  
Dust Aerosols Optical Depth at 550 nm



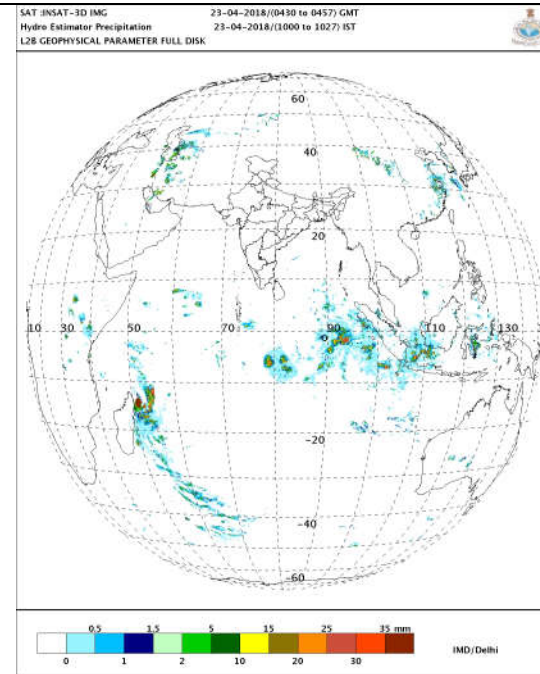
**Dust Forecast**



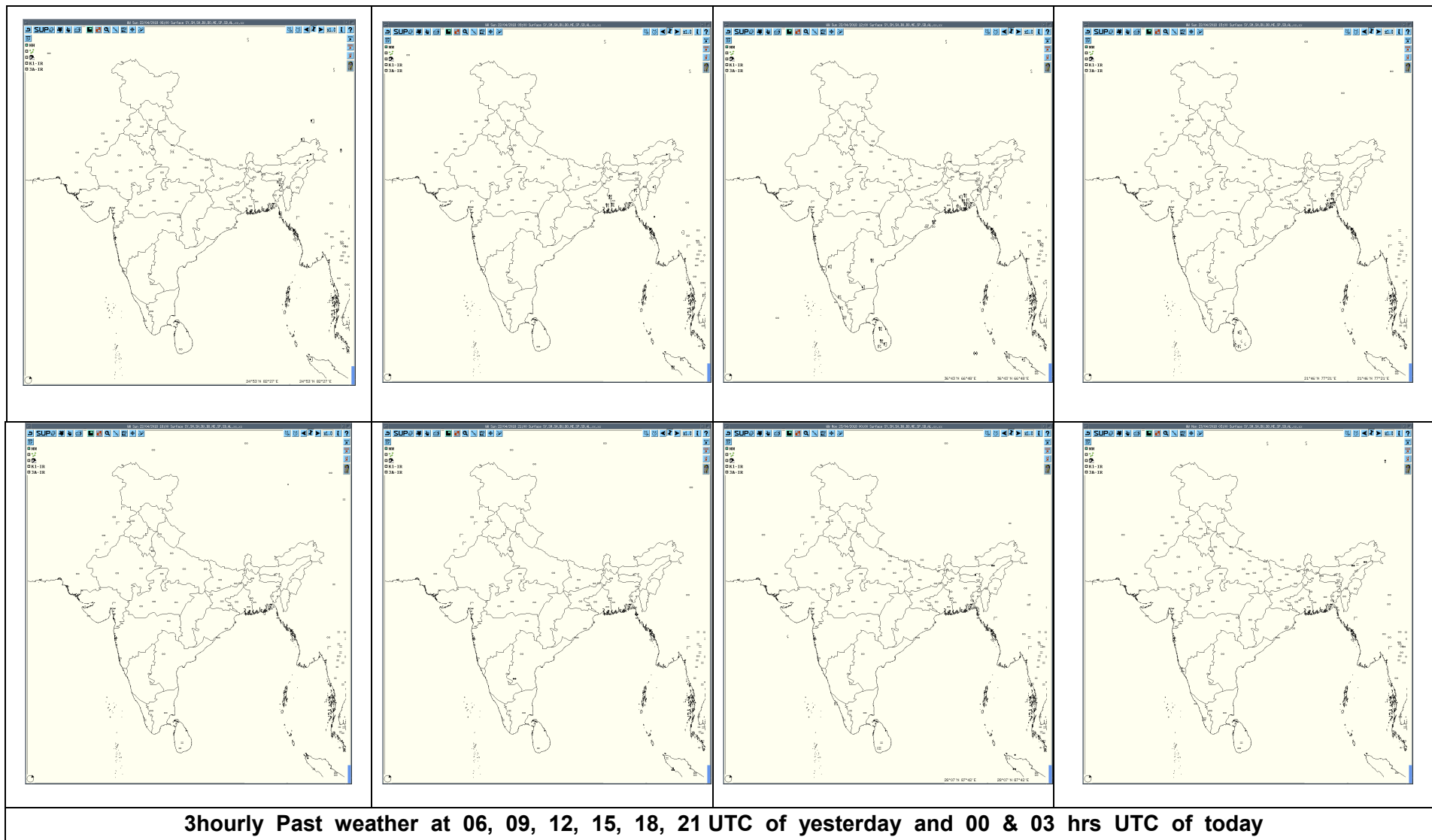
**IMR**

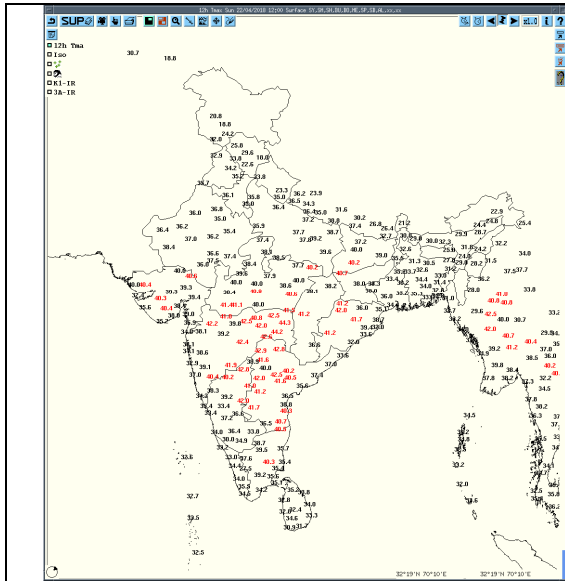


**Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today**

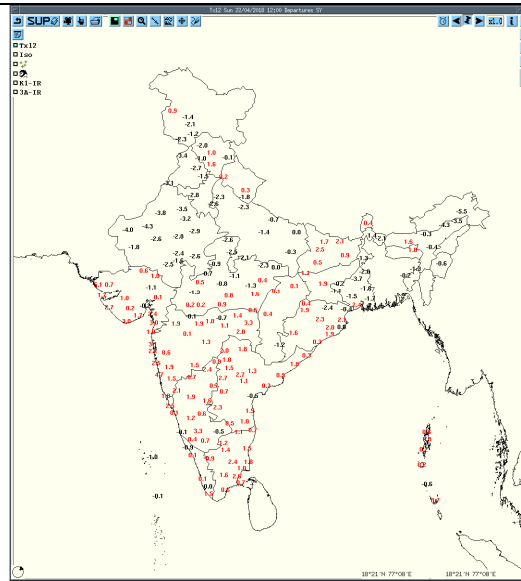


**HEM**

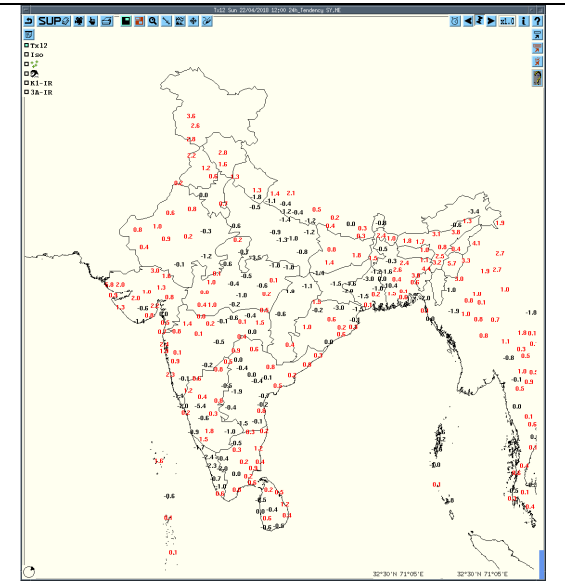




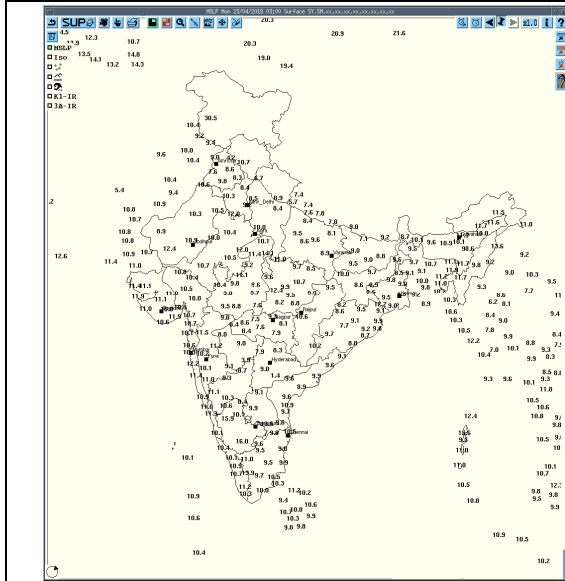
**Tmax**



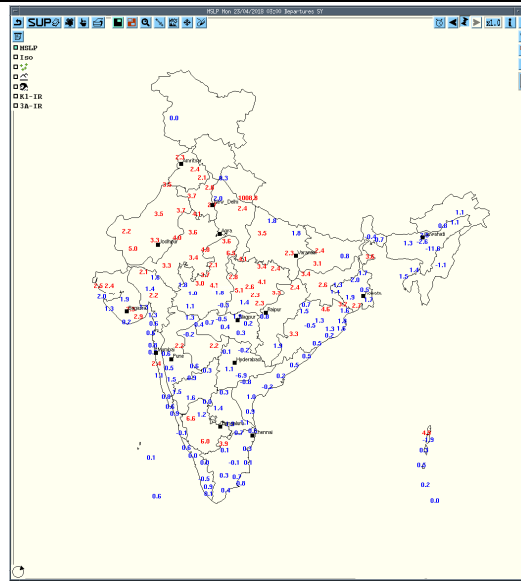
**Departure Tmax**



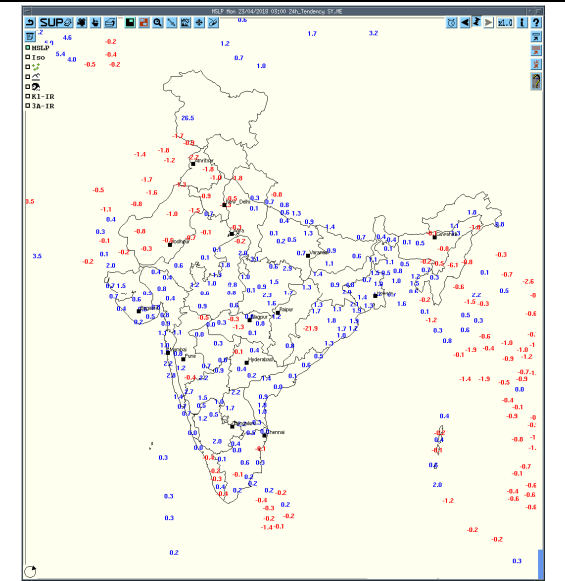
**Tendency Tmax**



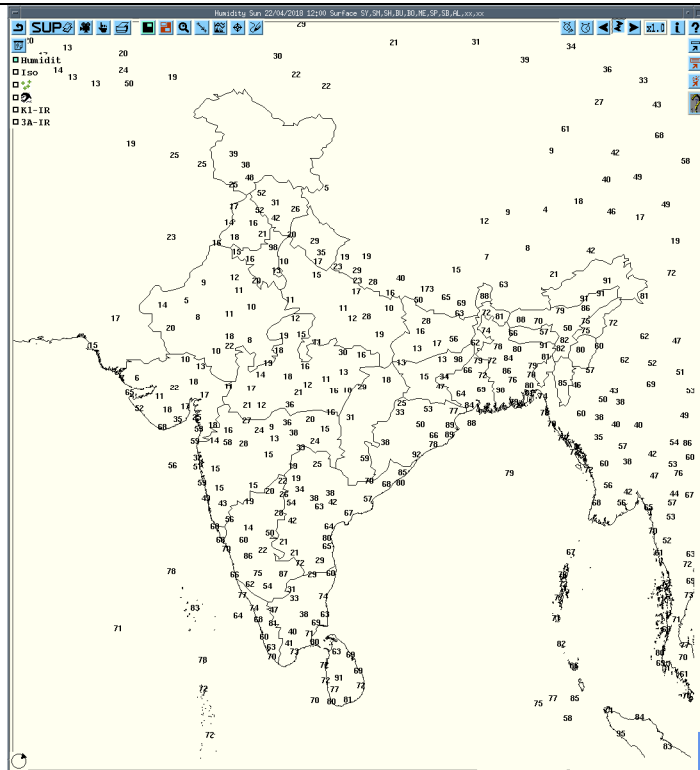
**MSLP**



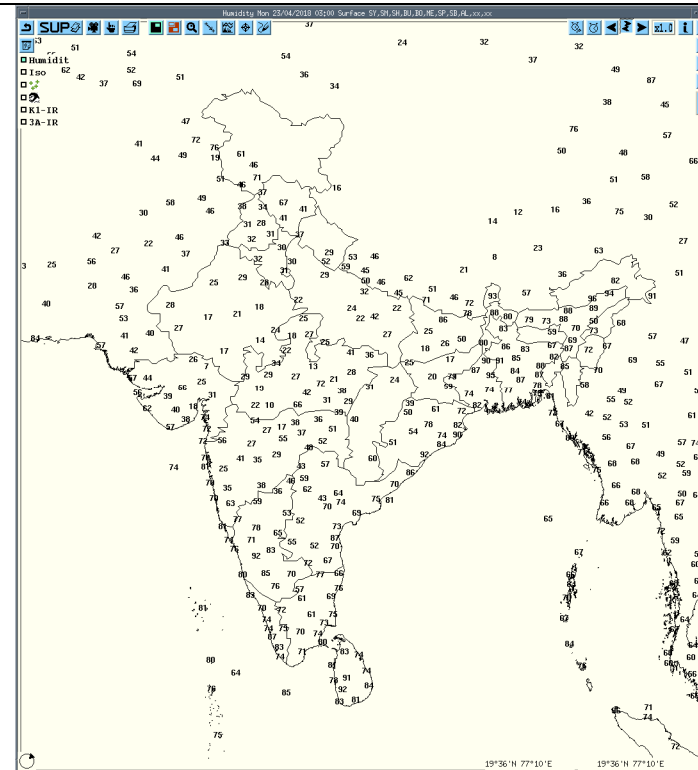
**Departure MSLP**



**Tendency MSLP**



**RH at 12UTC yesterday**



**RH at 03UTC today**



**Past 24 hours DWR Report:**

<b>Radar Station name</b>	<b>Date</b>	<b>Time interval of observation (UTC)</b>	<b>Organization of the cells (Isolated single cells/multiple cells/convective regions/squall lines) with height of 20 dBZ echo top and maximum reflectivity</b>	<b>Formation w.r.t radar station and Direction of movement</b>	<b>Remarks</b>	<b>Associated severe weather if any</b>	<b>Districts affected</b>
Visakhapatnam	23-04-18	220900	Isolated CB cells with maximum reflectivity of 60dBz with height of 15kms	W(80 KMS), NW(65 to 78 KMS) moving Sly	CB cells are forming at 0641UTC , developing and matured well (60dBz, 15KMS) at 0721UTC		Visakhapatnam, East Godavari Dist. (A.P)
		221200	Isolated CB cells with maximum reflectivity of 65dBz with height of 17kms	W(100 ,130 KMS), NW(92, 190 to 216 KMS) moving Sly	Since last observation CB cells are developing, matured well and dissipating. During the period CB cells matured well (65dBz, 17KMS) at 1131UTC		Vizianagaram, Visakhapatnam, East Godavari Dist. (A.P) Batsar(Chhattisgarh) Koraput(Orissa)
		221500	Isolated CB cells with maximum reflectivity of 64dBz with height of 17kms	NW(113, 150 KMS) moving SEly	CB cells are developing, matured well (64 dBz, 17KMS)and dissipating from 1251 UTC		Visakhapatnam, (A.P) Koraput&Malkangir (Orissa)
		221800	Isolated CB cells with maximum reflectivity of 63dBz with height of 14kms	NE(242 KMS) moving SEly	CB cells are developing, matured well (63 dBz, 14KMS) at 1731 UTC		Ganjam (Orissa)
		230000	Isolated CB cells with maximum reflectivity of 60dBz with height of 14kms	NE(230 KMS) moving SEly	Since last observation cb cells are developing and matured well and dissipated at 2131UTC		Ganjam (Orissa)
		230300	Convective region with maximum reflectivity of 48dBz with height of 3 kms	SE(104 to 150 KMS) moving Ely	Convective region formed in bay of Bengal at 0201UTC with Max. reflectivity of 48 dBz	-	In Bay of Bengal

<b>Radar Station name</b>	<b>Date</b>	<b>Time interval of observati on (UTC)</b>	<b>Organization of the cells (Isolated single cells/multiple cells/ convective regions/ squall lines) with height of 20 dBZ echo top and maximum reflectivity</b>	<b>Formation w.r.t radar station and Direction of movement</b>	<b>Remarks</b>	<b>Associated severe weather if any</b>	<b>Districts affected</b>
Patiala	23-04-18	220300-230252	No echo	--	--	--	--
Patna	23-04-18	220300-230300	Nil	Nil	Nil	Nil	Nil
Jaipur	23-04-18	220300-230300	Nil	Nil	Nil	Nil	Nil
Lucknow	23-04-18	220300-230300	Nil	Nil	Nil	Nil	Nil
Agartala	23-04-18	220300-230300	Multiple Cells Formed Over Ne & Se Of Tripura At 220500z,42 Dbz, About 10 Kms.	In A Radius Of 50 To 100 Kms, North, North-West,North-East & South –East, 30 Kmph, E-Ly.	Dissipated Over Hills Of Mizoram At 221142z	Thunderstorm Accompanied With Rain	Not Known
			Multiple Cells Formed Over B/Desh At 220830z Subsequently Forming Squall Line At 221200z, 50 Dbz, 14 Kms.	50 Kms To 200 Kms, West, South-West ,30 Kmph, E-Ly & Ne- Ly.	Squall/ TSRA Persisted Over TRP At 221400z When DWR Was Stopped Due To Power cut.	TSRA Occurred.	UDP, BLN& Adj. Areas.

Radar Station Name	Date	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
Kolkata	23-04-18	220301-220752	NIL	NIL	NOSIG ECHO	NIL	NIL
		220802-221042	1)Multi cell developed at a position from 22.610 N/ 87.928 E/ 276.5 Degree/ 43.8 km to 22.683 N/ 88.182 E/ 305.8 Degree/ 21.6 km away from radar at 0802 UTC transformed into big cell from 22.566 N/ 87.997 E/ 270.0 Degree/36.6 km to 22.800 N/ 88.553 E/ 037.6 Degree/ 32.8 km at 0832 UTC with maximum reflectivity of 61.5 dBz at 0822 UTC and maximum height of 12.18 Km at 0822 UTC	W (22.9 km) Moving in ENE-ward direction.	Multi Cells started forming at 0802 UTC at W (22.9 Km) from radar. Matured and merged with cell no. 2 and cell no. 3 at 0842 UTC and transformed into a multi-celled system, then moving into Bangladesh at 1042 UTC in E at a distance of 61.9 km from radar.	Thunderstorm /Rain	N/A
		220802-221042	2)Multi Isolated cell with maximum reflectivity of 62.5 dBz at 0822 UTC and maximum height of 13.70 Km at 0822 UTC	NNE (28.5 km) Moving in E-ward direction.	Cell started forming at 0802 UTC at NNE (28.5 Km) from radar. Matured, merged with cell no. 1 and cell no. 3 at 0842 UTC and transformed into a multi-celled system, then moving into Bangladesh at 1042 UTC in E at a distance of 61.9 km from radar.	Thunderstorm /Rain	N/A

Radar Station Name	Date	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
Kolkata	23-04-18	220802-221042	3)Multi Isolated cell with maximum reflectivity of 60.0 dBz at 0832 UTC and maximum height of 16.30 Km at 0832 UTC	ENE (39.7 km) Moving in E-ward direction.	Cell started forming at 0802 UTC at ENE (39.7 Km) from radar. Matured, merged with cell no. 1 and cell no. 2 at 0842 UTC and transformed into a multi-celled system, then moving into Bangladesh at 1042 UTC in E at a distance of 61.9 km from radar.	Thunderstorm /Rain	N/A
		220802-220842	4)Isolated cell with maximum reflectivity of 58.0 dBz at 0822 UTC and maximum height of 13.53 Km at 0822 UTC	NNE (139.0 km) Moving in E-ward direction.	Cell started forming at 0802 UTC at NNE (139.0 Km) from radar. Matured, moving completely into Bangladesh in NNE at 0842 UTC at a distance 142.3 km from radar.	Thunderstorm /Rain	N/A
		220811-220922	5)Multi Isolated cell with maximum reflectivity of 56.5 dBz at 0822 UTC and maximum height of 10.38 Km at 0822 UTC	SW (228.7 km) Moving in ENE-ward direction with a speed of 25 kmph.	Cell started forming at 0811 UTC at SW (228.7 Km) from radar. Matured, splitted into two cells at 0832 UTC, dissipated in SW at 0922 UTC at a distance of 201.6 km from radar.	Thunderstorm /Rain	N/A
		221042-221131	NIL	NIL	NOSIG ECHO	NIL	NIL
		221142-21301	6)Isolated cell with maximum reflectivity of 58.5 dBz at 1151 UTC and maximum height of 11.65 Km at 1202 UTC	WSW (247.8 km) Moving in E-ward direction at a speed of 23 kmph	Cell s coming from WSW (247.8 km) at 1142 UTC from radar. Matured, dissipated in WSW at 1301 UTC at a distance of 216.0 km from radar.	Thunderstorm /Rain	N/A
		221311-230302	NIL	NIL	NOSIG ECHO	NIL	NIL

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

Realised TS/HS/SQ during past 24hours 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 Commencement (IST)	Time of end(IST)
Bareilly	Northwest India	West Uttar Pradesh	Thunderstorm	22-04-18	2115	2150
Shahjhanpur	Northwest India	West Uttar Pradesh	Thunderstorm	22-04-18	1200	1300
Lengpui	Northeast India	Mizoram	Thunderstorm	22-04-18	1620	1845
Kailasahar	Northeast India	Tripura	Thunderstorm	22-04-18	1140	1700
Agartala	Northeast India	Tripura	Thunderstorm	22-04-18	1830	2050
Dum Dum	East India	West Bengal (GWB)	Thunderstorm	22-04-18	1355	1505
Bhubaneswar	East India	Odisha	Thunderstorm	22-04-18	1950	2050
Chandbali	East India	Odisha	Thunderstorm	22-04-18	1645	1730
Mahabubnagar	South India	Telangana	Thunderstorm	22-04-18	1455	1600
Kurnool	South India	Rayalaseema	Thunderstorm	22-04-18	1500	1600
Karipur A P	South India	Kerala	Thunderstorm	22-04-18	1543	1730
Belgaum_AP	South India	Karnataka (NIK)	Thunderstorm	22-04-18	1625	1720
Chitradurga	South India	Karnataka (SIK)	Thunderstorm	22-04-18	1740	1905
Madikeri	South India	Karnataka (SIK)	Thunderstorm	22-04-18	1335	1800
Bengaluru City	South India	Karnataka (SIK)	Thunderstorm	22-04-18	1620	1700
AMS HAL Bengaluru	South India	Karnataka (SIK)	Thunderstorm	22-04-18	1600	1820
KIAL Bengaluru	South India	Karnataka (SIK)	Thunderstorm	22-04-18	1530 2146	1630 2250
Yelahanka IAF	South India	Karnataka (SIK)	Thunderstorm	22-04-18	1430 2200	1730 2400
Chamarajanagar	South India	Karnataka (SIK)	Thunderstorm	22-04-18	1600	1630

## 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)

Past24hourHEMandIMRainfall(upto03UTCoftoday)

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)

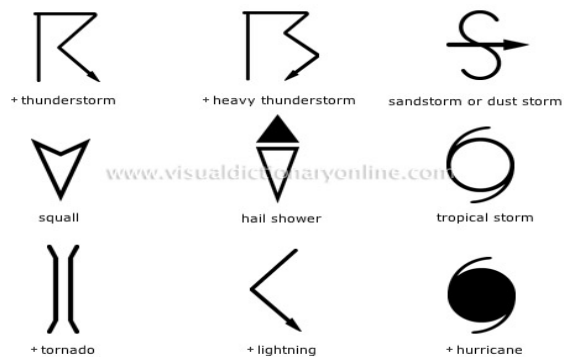
ForRadarimagesofthepast24hoursincludingmosaicofimages:

[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>	