



# India Meteorological Department

## FDP STORM Bulletin No. 43 (18-04-2018)

### 1. CURRENT SYNOPTIC SITUATION:

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

- ◆ The Western Disturbance as a feeble cyclonic circulation at 3.1 km above mean sea level over north Pakistan & adjoining Jammu & Kashmir with a trough aloft in mid & upper tropospheric westerlies with its axis at 5.8 km above mean sea level runs roughly along longitude 55° E and north of latitude 28°N persists.
- ◆ The fresh Western Disturbance is likely to affect Western Himalayan region & adjoining plains from 19th onwards.
- ◆ The cyclonic circulation over Sub Himalayan West Bengal & neighbourhood extending upto 0.9 km above mean sea level persists.
- ◆ The trough of low at mean sea level over Comorin Maldives area with the embedded cyclonic circulation extending upto 1.5 km above mean sea level persists.
- ◆ The north south wind discontinuity from Rayalaseema to south Tamilnadu at 0.9 km above mean sea level persists.
- ◆ The cyclonic circulation over south Kerala and neighbourhood extending up to at 0.9 km above mean sea persists.
- ◆ The cyclonic circulation over Jharkhand & adjoining Bihar extending up to at 0.9 km above mean sea persists.
- ◆ The cyclonic circulation over south Konkan & Goa and neighbourhood extending up to at 0.9 km above mean sea persists.
- ◆ The trough in mid tropospheric westerlies with its axis at 5.8 km above mean sea level roughly along longitude 90°E and north of latitude 22°N persists.
- ◆ The north south trough from north Uttar Pradesh to north Telangana across East Madhya Pradesh and Vidarbha at 0.9 km above mean sea level persists

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

##### Current Observation (based on 0900UTC imagery of INSAT 3D):

##### Western disturbance (WD):

Scattered multi-layered clouds seen over East Afghanistan, North Pakistan, Jammu & Kashmir, North Tibet, Central China and over the area between lat 37.0°N to 50.0°N, long 70.5°E to 100.0°E in association with another WD over the area.

##### Convective Activity:

Developed convective cells are developing over extreme Northeast Arunachal Pradesh, Southeast Jharkhand, extreme Odisha, Southern parts of North Coastal Andhra Pradesh and Central Kerala.

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

Based on 0900 UTC satellite data indicate that precipitation is likely to take place during next three (03 hrs) over extreme Jammu & Kashmir, Kerala, South Tamilnadu and over Lakshadweep.

### **Clouds descriptions within India:**

Scattered low/medium clouds with embedded moderate to intense convection seen over Northwest Jammu & Kashmir, Central Kerala, North Coastal Andhra Pradesh, South Tamilnadu and Comorin. Scattered low/medium clouds with embedded weak to moderate convection seen over Southeast Arunachal Pradesh, Southeast Jharkhand, Southwest Odisha and isolated over rest Jammu & Kashmir and rest Kerala.

Scattered low/medium clouds seen over rest North Himachal Pradesh, North Uttarakhand, Sub-Himalayan West Bengal, Sikkim, Chhattisgarh, rest Odisha, rest Jharkhand, Assam and Nagaland, Manipur, Meghalaya, Madhya Maharashtra,

### **Arabian Sea:-**

Scattered low/medium clouds with embedded moderate to intense convection seen over South Arabian Sea, South Lakshadweep and Comorin

### **Bay of Bengal & Andaman Sea:**

Broken low/medium clouds with embedded isolated moderate to intense convection seen over South Bay South of lat 8.0 deg N and South Andaman Sea.

### **Past Weather:**

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

Moderate to Intense convection was observed over Gangetic West Bengal SHWB Sikkim Maharashtra Konkan & Goa adjoining Karnataka North Interior Karnataka extreme south Kerala adjoining south Tamilnadu and Weak to Moderate convection observed over J&K Himachal Pradesh Uttarakhand east Madhya Pradesh north Chhattisgarh north-east Bihar Jharkhand Odisha north Andhra Pradesh north-east states.

#### **OLR:**

Up-to 230wm-2 observed over Jammu & Kashmir North Himachal Pradesh North Uttarakhand Sikkim Arunachal Pradesh Meghalaya Assam Nagaland Manipur south Mizoram Gangetic West Bengal south Maharashtra adjoining Karnataka Konkan & Goa costal & south Karnataka Kerala and south Tamilnadu.

#### **Dynamic Features:**

Up to 30- 60 knots **wind shear** is observed over North & Central India and 5-15 knots over south peninsula India.

A **positive Vorticity** field at 850 hPa is observed over J&K Himachal Pradesh Uttarakhand Uttar Pradesh north-west Madhya Pradesh Meghalaya south-east Assam Gangetic West Bengal south Chhattisgarh & north Tamilnadu.

#### **Precipitation:**

##### **IMR:**

Rainfall upto 90-150 mm observed over most parts of Madhya Maharashtra Konkan & east-central Gangetic West Bengal.

Rainfall upto 50-70 mm observed over some parts of Madhya Maharashtra east-central Gangetic West Bengal extreme south Tamilnadu.

Rainfall upto 10-30 mm observed over some parts of North-West Jammu & Kashmir Madhya Maharashtra north Andhra Pradesh northwest Karnataka Kerala & Tamilnadu.

Rainfall upto 01-10 mm observed over most parts of J&K Sikkim SHWB north-east states and some parts of north Himachal Pradesh north Uttarakhand north east Bihar Odisha south Chhattisgarh north Andhra Pradesh south Marathwada Goa extreme north Interior Karnataka south Karnataka North Coastal Andhra Pradesh Kerala & south Tamilnadu

### RADAR and RAPID RGB Observation:

Isolated/multiple moderate echoes (dBZ around 50-55 and height >10km) are seen in domain of DWR Gopalpur, Kolkata, Machilipatnam, Vishakhapatnam and isolated/multiple light echoes in domain of Agartala, Hyderabad and Patna at around 1710IST.

RAPID RGB Satellite imagery at 1630IST indicates significant convection over Jammu & Kashmir, Himachal Pradesh, South Jharkhand, Odisha, Chhattisgarh, North Coastal Andhra Pradesh, Coastal Karnataka and Kerala.

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

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

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

| Delhi – SAFAR analysis & Forecast | 18.04.2018 | 19.04.2018 |
|-----------------------------------|------------|------------|
| PM10 (micro-g/m <sup>3</sup> )    | 181        | 164        |
| PM2.5 (micro-g/m <sup>3</sup> )   | 85         | 78         |

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

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

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

**Low level CYCIRS, Troughs: 00 UTC of Day 2-5: A**

**00 UTC of Day 2-5:** A deep trough and associated strong winds over Bangladesh and adjoining NE region

**00UTC of Day 2-3:** 850 hPa trough from U.P to S. Peninsular India across MP and Maharashtra

**Confluence & wind Discontinuity regions: 12 UTC of Day 0-2:** 925hPa N-S discontinuity over Southern Peninsular India and in Day 0-4 SW-NE discontinuity over MP Chhattisgarh & Odisha

#### **Synoptic Systems:**

**12 UTC of Day 0-1:** WD as a trough over north Pakistan and adjoining J &K.

**12 UTC of Day 2:** A fresh WD as a deep trough and associated CYCIR at 500 hPa over Pakistan and adjoining J & K.

**00UTC of Day 1-5:** 925 hPa anticyclone over Bay of Bengal. In Day 1-4 associated south-easterly winds are stronger along the east coast and over Bangladesh

**2. Location of jet and jet core (>60kt) at 500hPa): 12UTC of Day 2** Over Gujarat & Rajasthan associated with approaching WD

#### **3. Convergence at 850 hPa:**

**Day/Index: Subdivisions with Lower Level Convergence > 15 x 10<sup>-5</sup> /s**

Day0: NE NMMT, Odisha, SI Karnataka, Kerala,

Day1: NE NMMT, West UP, Jammu Kashmir, Odisha, East MP, Madhya Maharashtra, NI Karnataka,

Day2: Assam Meghalaya, NE NMMT, Gangetic WB, Jharkhand, West UP, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha, Madhya Maharashtra, Chhattisgarh, Telangana,

Day3: Arunachal Pradesh, Assam Meghalaya, Madhya Maharashtra, Telangana, NI Karnataka, SI Karnataka,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Jharkhand, Odisha, East MP, Madhya Maharashtra, Marathwada, 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: Assam Meghalaya, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Himachal Pradesh, Jammu Kashmir,

Day1: Assam Meghalaya, Sub Himalayan WB, Jharkhand, Bihar, East UP, Uttarakhand, Himachal Pradesh,

Day2: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, West UP, Haryana, Chandigarh, Delhi, Punjab, West RJ, Chhattisgarh, Tamilnadu, Puducherry,

Day3: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Gangetic WB, Himachal Pradesh, Odisha,

Day4: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Uttarakhand, Himachal Pradesh, NI Karnataka,

Day4: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Gangetic WB, Bihar, Uttarakhand, Odisha,

#### 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, Gangetic WB, Jharkhand, Bihar, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Konkan Goa, Madhya Maharashtra, Coastal AP, Rayalseema, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Konkan Goa, Madhya Maharashtra, Coastal AP, Telangana, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Bihar, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha, Konkan Goa, Coastal AP, Telangana, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Bihar, Uttarakhand, Himachal Pradesh, Odisha, Chhattisgarh, Coastal AP, Tamilnadu, Puducherry, Coastal Karnataka, SI Karnataka, Kerala,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Himachal Pradesh, Jammu Kashmir, Odisha, Vidarbha, Chhattisgarh, Coastal AP, 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, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Konkan Goa, Madhya Maharashtra, Chhattisgarh, Coastal AP, Telangana, Coastal Karnataka, NI Karnataka, SI Karnataka,

Day1: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ,

Day2: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha, Chhattisgarh, Coastal AP,

Day3: Arunachal Pradesh, Sub Himalayan WB, Gangetic WB, Bihar, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha, Vidarbha, Chhattisgarh, Coastal Karnataka, SI Karnataka,

Day4: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha, East MP, Vidarbha, Chhattisgarh

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

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

Day0: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Gangetic WB, Bihar, Uttarakhand, Odisha, Konkan Goa, Madhya Maharashtra, Chhattisgarh, Coastal AP, Telangana, Rayalseema, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,  
Day1: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Odisha, Chhattisgarh, Coastal AP, Telangana, Rayalseema, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,  
Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Himachal Pradesh, Odisha, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalseema, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,  
Day3: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Uttarakhand, Odisha, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalseema, Tamilnadu, Puducherry, Coastal Karnataka, SI Karnataka, Kerala,  
Day4: Arunachal Pradesh, Sub Himalayan WB, Odisha, Vidarbha, Chhattisgarh, Coastal AP, 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, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Jammu Kashmir,  
Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Jammu Kashmir,  
Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Uttarakhand, Himachal Pradesh, Jammu Kashmir,  
Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT,  
Day5: Arunachal Pradesh, Assam Meghalaya,

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

### 1. Synoptic Systems:

The analysis based on 00 UTC indicates a cyclonic circulation in lower troposphere (925 hPa) over parts of Jharkhand and adjoining Bihar. The forecast shows it will persist till next 48 hours. The analysis shows another cyclonic circulation over south Konkan and Goa and adjoining areas. The forecast shows it will become less marked in next 24 hours. The analysis shows a cyclonic circulation in lower troposphere over east Uttar Pradesh and adjoining areas. The forecast shows it will move eastward till day 2. The forecast shows a cyclonic circulation over North Pakistan adjoining northwest Rajasthan and Punjab region on next 24 hours. The analysis shows a cyclonic circulation over SHWB and adjoining areas. A north- south trough is seen in the analysis extending from Rayalaseema to south Tamil Nadu. It will persist for next 24 hour forecast. The analysis shows a north- south oriented Trough from north Uttar Pradesh to north Telangana across East Madhya Pradesh and east Vidarbha. The forecast shows it will persist till day 3 with slight eastward shift.

### 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 3 days.

### 3. Low Level Vorticity {850hPa Positive Vorticity (>12 x 10<sup>-1</sup>/s):

Low level Positive Vorticity is seen mostly along the foothills of Himalaya, J&K, Himachal Pradesh and Uttarakhand; along the north- south trough for next 3 days. Low level Positive Vorticity is also seen over Northwest Rajasthan and adjoining Punjab region in next 24 hours. It is inferred that J&K, Punjab, Haryana, Delhi, adjoining Uttar Pradesh and Rajasthan has Positive Vorticity from day 2 onwards.

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

**Lifted Index (< -2):** The threshold value of the index is below -2 over parts of Gujarat, coastal Andhra Pradesh, Karnataka, Telangana, Rayalaseema, Konkan and Goa, Kerala, Tamil Nadu, southern part of west coast, coastal areas along the east coast, Chhattisgarh, East Uttar Pradesh, Bihar, Jharkhand, Vidarbha, Madhya Maharashtra, Marathwada, Orissa, GWB, SHWB, Sikkim and NE states on all 3 days; over parts of south west Rajasthan on day 2; over parts of J&K, Rajasthan, Punjab, Haryana and adjoining areas, Uttarakhand, Himachal Pradesh on day 3; maximum negative value of the index less than -10 is seen over parts coastal Orissa, GWB and Kolkata on day 1; over parts of Bihar, Jharkhand, GWB, SHWB and East Uttar Pradesh on day 3.

**Total Total Index (> 50):** The threshold value of the index is > 50 over parts of Himachal Pradesh, Uttarakhand, Rajasthan, Haryana, Delhi, Uttar Pradesh, Gujarat, Madhya Pradesh, Vidarbha, Madhya Maharashtra, Marathwada, Chhattisgarh, Bihar, Jharkhand, GWB, Telangana, Karnataka and Andhra Pradesh during next 3 days; maximum value of the index >60 is seen over parts of Rajasthan, Gujarat, Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Vidarbha, Bihar, Jharkhand, Orissa, Telangana during next 3 days; over parts of Punjab, Haryana and adjoining areas, GWB, Madhya Maharashtra, Marathwada and north Karnataka on day 2; over parts of Punjab, GWB and Karnataka on day 3; over parts of Uttarakhand on day 1 and 2.

**Sweat Index (> 300):** Although the threshold value of the Index >300 is seen in most parts of the country except Haryana and adjoining areas, central parts of Madhya Pradesh and northern parts of Chhattisgarh during next 3 days, the maximum value of the index greater than 800 is seen over parts of GWB and Orissa on day 1; over parts of Bihar, Jharkhand, GWB, Orissa and East Uttar Pradesh on day 3.

**CAPE (> 1000):** Mostly in areas of southern peninsular India, along west coast and east coast, parts of Orissa, Andhra Pradesh, Telangana, Kerala, Tamil Nadu, Karnataka, coastal Maharashtra including Mumbai, Konkan and Goa, Gujarat, Bihar, Jharkhand, GWB, SHWB, Assam, Tripura and adjoining areas during next 3 days; over parts of East Uttar Pradesh and some parts of southwest Rajasthan 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 Maharashtra, Karnataka, Konkan & Goa and coastal Kerala during next 3 days; over parts of Rayalaseema and adjoining areas on day 2; over parts of coastal Gujarat, Bihar, Jharkhand, SHWB 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 J&K, Himachal Pradesh, Uttarakhand, Haryana, Delhi, west Uttar Pradesh, south east Rajasthan, Madhya Pradesh on day 1 and 2 and over most parts of the country except southeast Rajasthan, south west Uttar Pradesh, Madhya Pradesh, northern parts of Chhattisgarh, southern parts of Madhya Maharashtra and Marathwada on day 3, the maximum value of the index > 200 is seen over parts of Gujarat, northern parts of coastal Maharashtra, SHWB, Bihar, Jharkhand, East Uttar Pradesh, Orissa, Andhra Pradesh, Chhattisgarh, Telangana, Assam, Tripura and adjoining areas during next 3 days; over parts of north interior Karnataka and adjoining areas on day 2 and 3; over parts of J&K, Punjab, Haryana and adjoining areas, west Uttar Pradesh on day 3.



## **5. Rainfall Activity:**

40-70 mm Rainfall: over parts of J&K and Himachal Pradesh on day 3.

10- 40 mm Rainfall: over parts Jammu and Kashmir, Karnataka, Kerala, Tamil Nadu, Sikkim and NE states during next 3 days; over parts of coastal Orissa and Andhra Pradesh on day1; over parts of Himachal Pradesh on day 2 and 3; over parts of Uttarakhand on day 3.

Up to 10 mm rainfall: Over parts of J&K, Foothills of Himalaya, Punjab, Himachal Pradesh, Uttarakhand, Sikkim, NE states, Orissa, Bihar, Jharkhand, GWB, SHWB, Chhattisgarh, Andhra Pradesh, Rajasthan, Kerala, Karnataka, Tamil Nadu, Telangana, Rayalaseema, coastal Maharashtra, Konkan and Goa on all 3 days; over southern parts of Marathwada, Madhya Maharashtra on day 1 and 2; over parts of Haryana, Delhi and west Uttar Pradesh on day 3.

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

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

**> 25 dBZ Model Reflectivity:** Over parts of J&K, Orissa, GWB, North & South interior Karnataka adjoining south Madhya Maharashtra, Marathwada, Telangana, Kerala, Tamil Nadu, Konkan and Goa, SHWB and NE states on day 1; over parts of J&K, Himachal Pradesh, Uttarakhand, Sikkim, SHW, NE states, Bihar, Jharkhand, GWB, Punjab, west Rajasthan on day 2; over parts of J&K, Punjab, Haryana, Delhi, northwest Rajasthan, Himachal Pradesh, Uttarakhand, adjoining west Uttar Pradesh, Assam, Meghalaya, Tripura, Mizoram and adjoining areas on day 3; maximum value of the Model reflectivity is seen over parts of Konkan & Goa, southern parts of Maharashtra, Karnataka, Assam, Tripura, Mizoram and adjoining areas on day 1; over parts of J&K, Himachal Pradesh and Uttarakhand on day 2 and 3; Assam, Tripura and adjoining areas during next 3 days; over parts of GWB, adjoining Bihar, Jharkhand and Orissa 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, southern parts of west coast and the east coast, southern parts of Andhra Pradesh, south interior Karnataka, Konkan and Goa, south coastal Maharashtra, Bihar, Jharkhand, Sikkim, GWB and NE states during all 3 days; below threshold value is seen over some parts of Orissa and Chhattisgarh on day 1; over parts of J&K, Himachal Pradesh, Uttarakhand, Rajasthan, Haryana, Delhi, west Uttar Pradesh, north Madhya Pradesh, Madhya Maharashtra, Marathwada, Chhattisgarh and Orissa on day 3. maximum value of the index is seen over parts of J&K, Punjab, Haryana, Delhi, Rajasthan, Uttar Pradesh, Madhya Pradesh, Jharkhand, Vidarbha, GWB, Madhya Maharashtra, Marathwada, Telangana and Orissa during all 3 days; over parts of Gujarat on day 1 and 2; over parts of Andhra Pradesh and Bihar 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 Gujarat, 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, Assam, Tripura and adjoining areas on all 3 days; over some parts of East Uttar Pradesh 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, coastal Maharashtra, Konkan and Goa, GWB, coastal Tamil Nadu for next 3 days; over parts of Telangana and coastal Gujarat on day 2; over parts of Telangana and adjoining south Chhattisgarh 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 Himachal Pradesh, Uttarakhand, Haryana, Delhi, West Uttar Pradesh, Madhya Pradesh, north Chhattisgarh and west Vidarbha during day 1; on day 2 and 3 over most of the parts of country except south east Rajasthan, Madhya Pradesh, north Chhattisgarh, west Vidarbha, north Madhya Maharashtra and Marathwada and west Uttar Pradesh; the maximum value of the index > 400 is seen over Gujarat, Bihar, Jharkhand, GWB, Orissa, Chhattisgarh, Vidarbha, Telangana, Northern parts of Coastal Maharashtra and Andhra Pradesh on day 1; over parts of Gujarat, Punjab, Rajasthan, Coastal Maharashtra, Chhattisgarh, Orissa, GWB, East Uttar Pradesh, Vidarbha, Telangana and Andhra Pradesh on day 2; over parts of GWB, Orissa, Bihar, Jharkhand, East Uttar Pradesh, Telangana Chhattisgarh, Karnataka Konkan and Goa on day 3..

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

70- 130 mm Rainfall: over parts of Konkan and Goa, Tripura, Mizoram and adjoining areas on day 1; over parts of Himachal Pradesh and Uttarakhand on day 3; over parts of J&K on day 2 and 3;

40-70 mm Rainfall: over parts of J&K, Assam, Tripura and adjoining areas during next 3 days; over parts of Konkan and Goa and South Karnataka on day 1; over parts of Himachal Pradesh and Uttarakhand on day 3.

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

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

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

#### **Summary and Conclusions:**

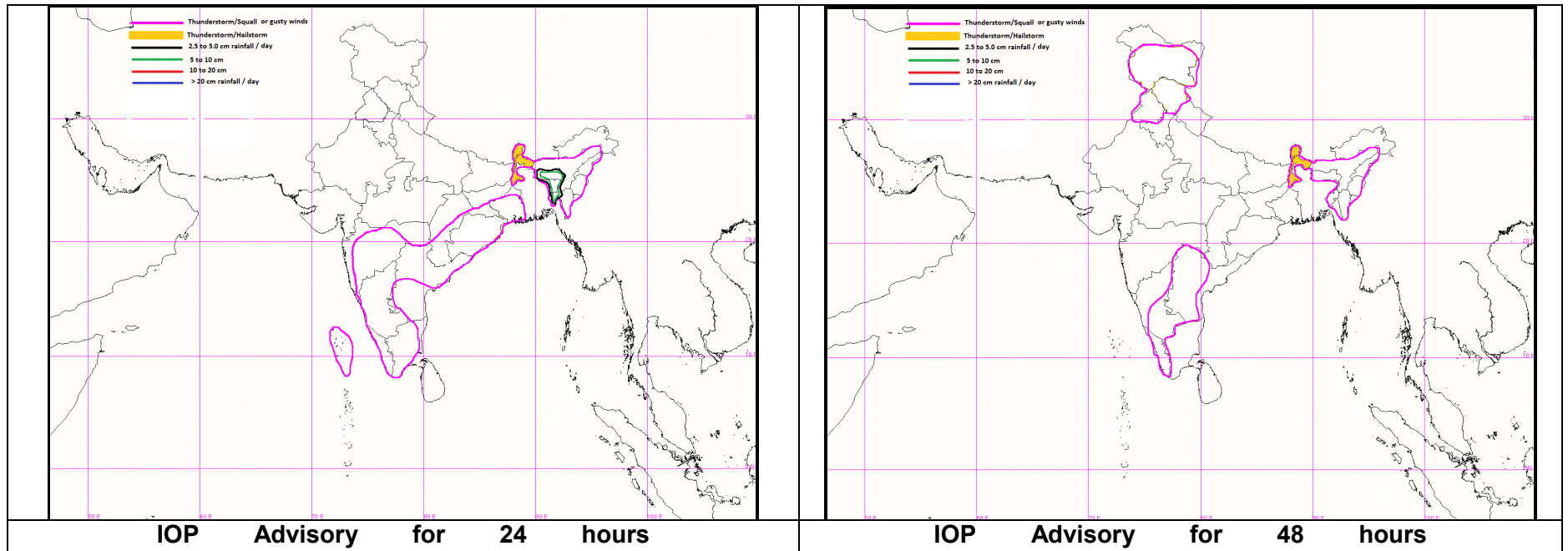
- Synoptic analysis indicates that a cyclonic circulation over Sub Himalayan West Bengal & neighbourhood and another cyclonic circulation lie over Jharkhand & adjoining Bihar will give rise to thunder squall with hail specifically over Sub-Himalayan West Bengal & Sikkim, Odisha on Day-1. With these systems, Assam, Meghalaya, Nagaland, Manipur, Mizoram & Tripura may get some thunderstorm with gusty winds activity on Day-1. Meghalaya and Tripura may receive heavy rainfall on Day-1.
- Due to the north-south wind discontinuity from Rayalaseema to south Tamilnadu, thunderstorm with gusty winds activity may likely to be observed over Marathwada, Madhya Maharashtra
- Coastal Andhra Pradesh, Telangana, Karnataka, Kerala, Tamilnadu on Day-1.
- A fresh Western Disturbance as an upper air cyclonic circulation extending upto 3.1 km above mean sea level lies over Iran and neighbourhood with a trough aloft in mid & upper tropospheric westerlies.



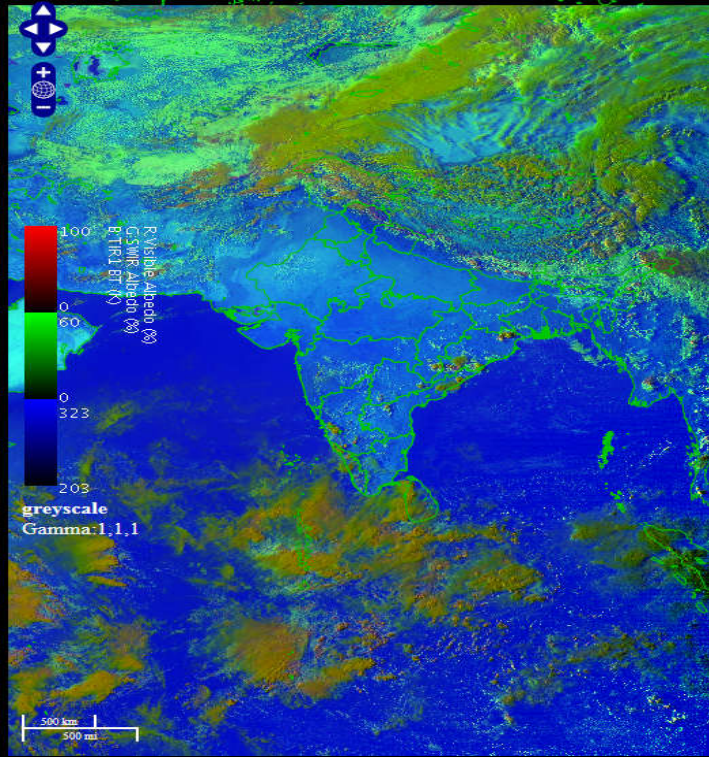
**Day-1 & Day-2:**

|   |   |
|---|---|
| <p><b>Significant Rainfall:</b><br/>Meghalaya, Tripura</p> <p><b>Thunderstorm with Squall/Gusty winds:</b><br/>Assam, Meghalaya, Nagaland, Manipur, Mizoram &amp; Tripura<br/>Gangetic West Bengal, Odisha, Jharkhand<br/>Marathwada, Madhya Maharashtra, Chhattisgarh<br/>Coastal Andhra Pradesh, Telangana, Karnataka, Kerala, Tamilnadu, Lakshadweep</p> <p><b>Thunderstorm with Squall &amp;Hailstorm:</b><br/>Sub-Himalayan West Bengal &amp; Sikkim</p> | <p><b>Significant Rainfall:</b><br/>Nil</p> <p><b>Thunderstorm with Squall/Gusty winds:</b><br/>Assam, Meghalaya, Nagaland, Manipur, Mizoram &amp; Tripura<br/>Kerala, South Interior Karnataka, Rayalaseema, Telangana<br/>Jammu &amp; Kashmir, Himachal Pradesh, Punjab</p> <p><b>Thunderstorm with Squall &amp;Hailstorm:</b><br/>Sub-Himalayan west Bengal &amp; Sikkim</p> |
|---|---|

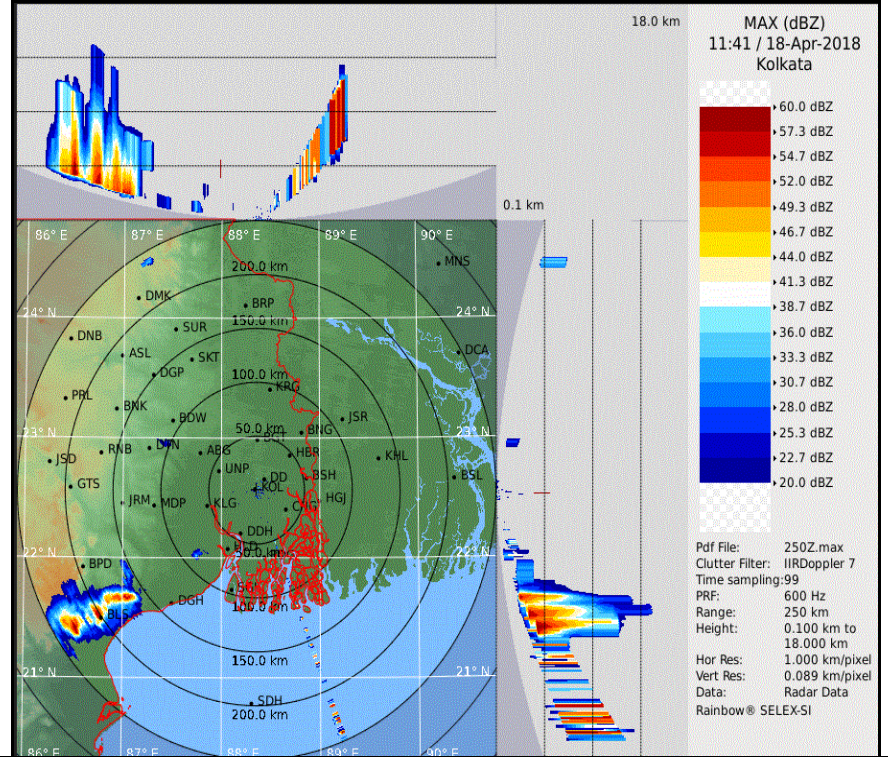
**Graphical Presentation of Potential Areas for Severe Weather:**





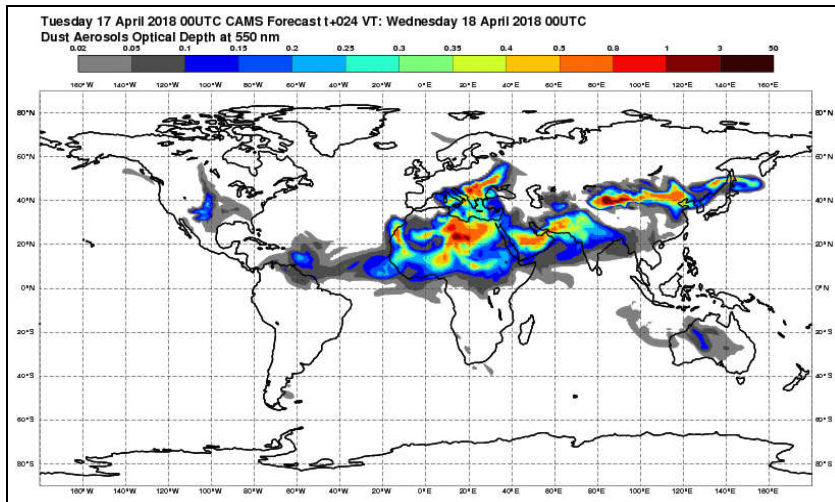


**RAPID RGB Imagery at 1630 IST of the Day**

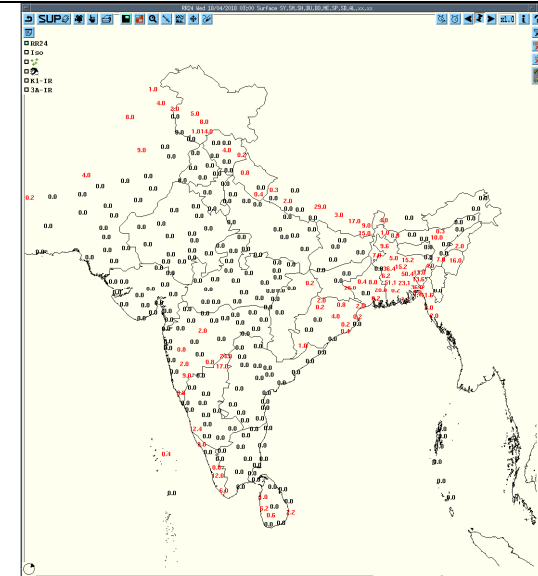


**DWR Kolkata at 1711 IST of the Day**

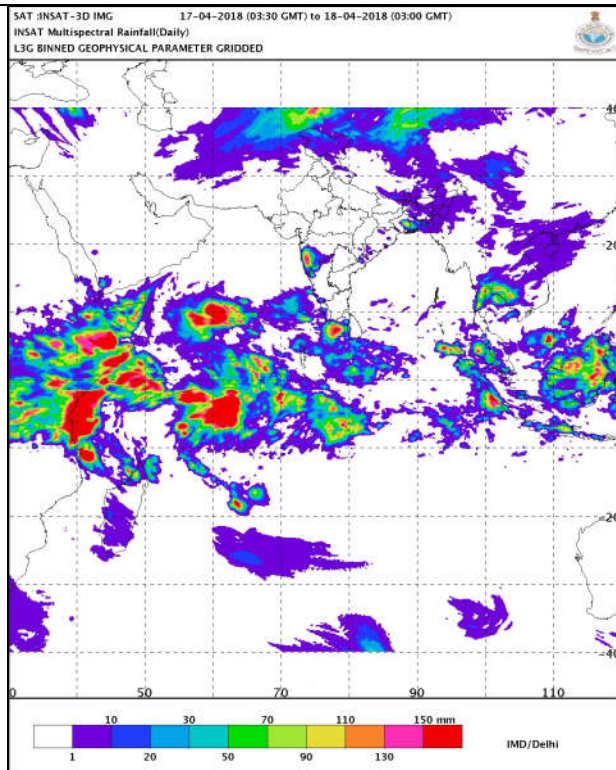




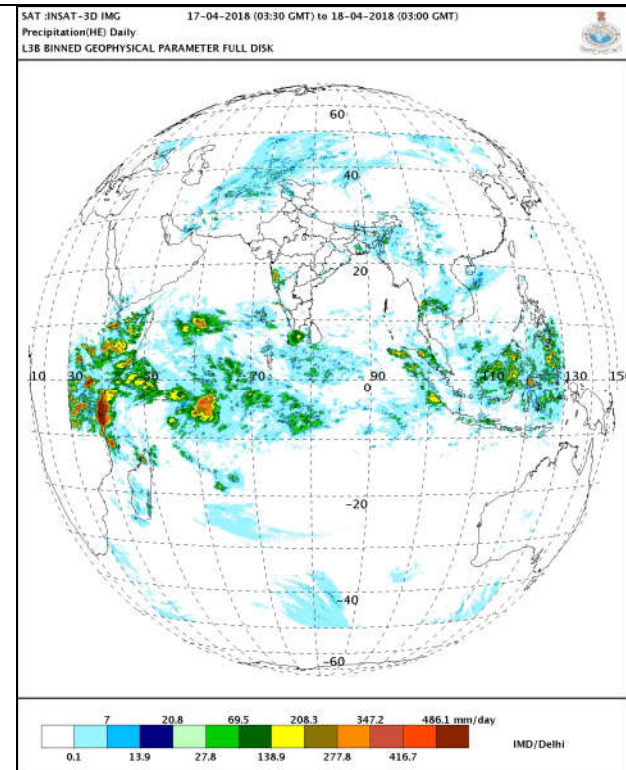
**Dust Forecast**



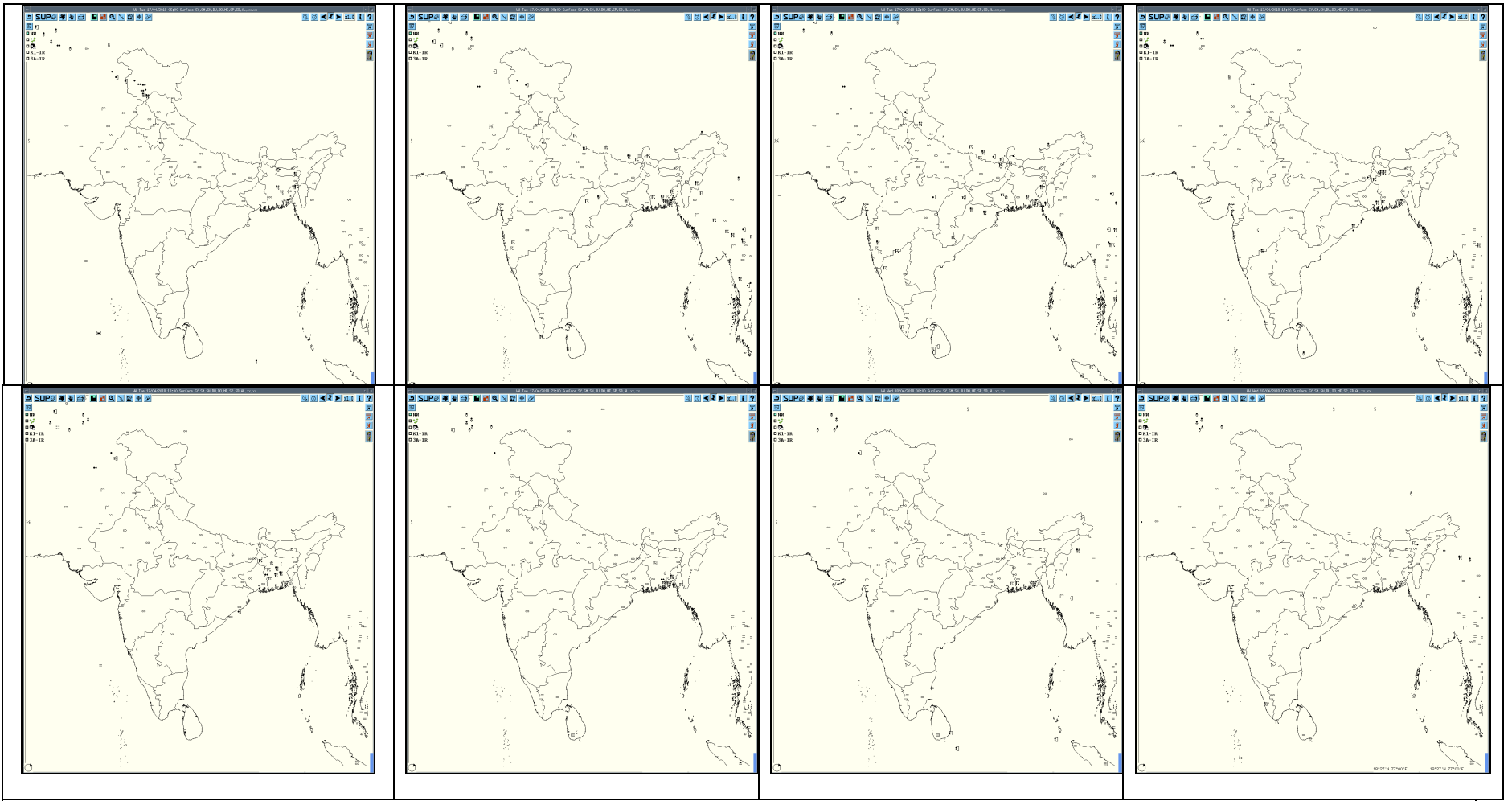
**Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today**



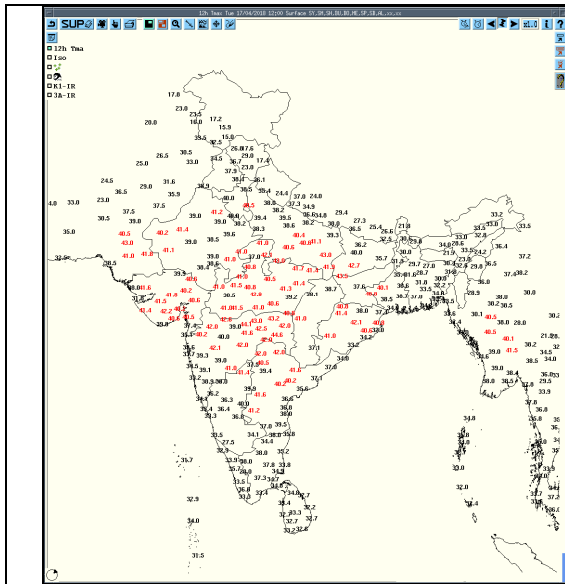
**IMR**



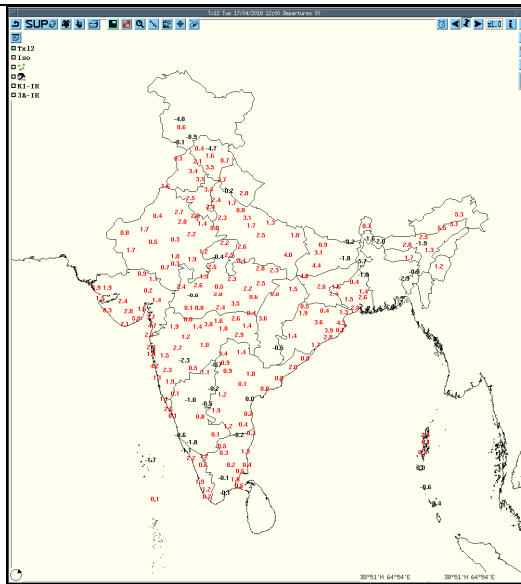
**HEM**



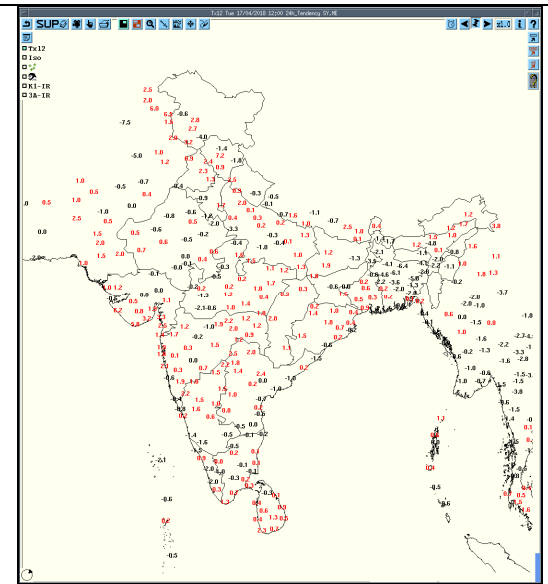
3hourly Past weather at 06, 09, 12, 15, 18, 21 UTC of yesterday and 00 & 03 hrs UTC of today



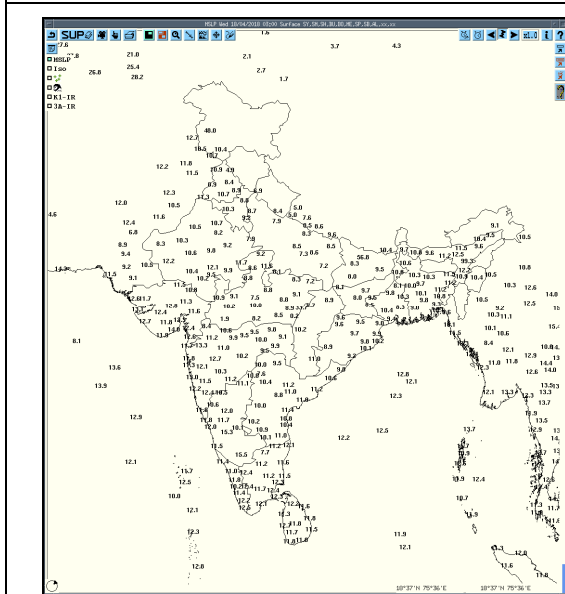
**Tmax**



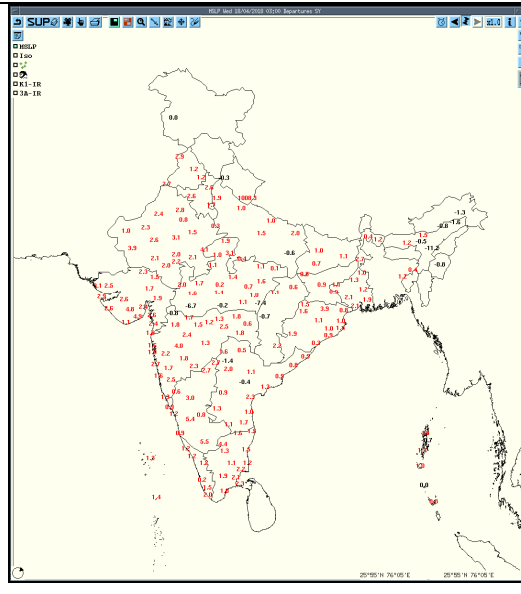
**Departure Tmax**



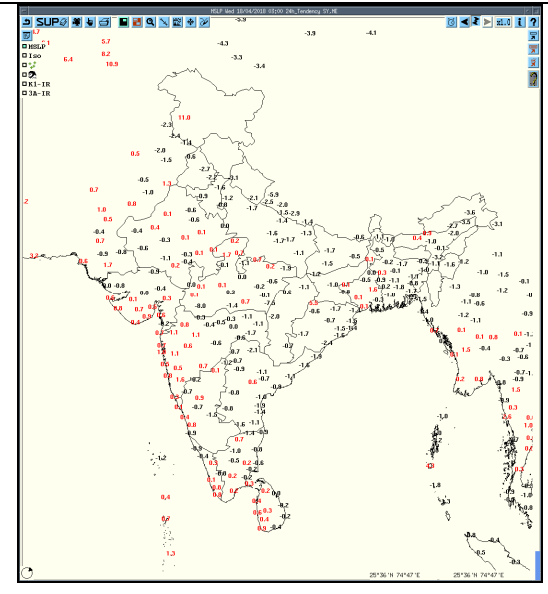
**Tendency Tmax**



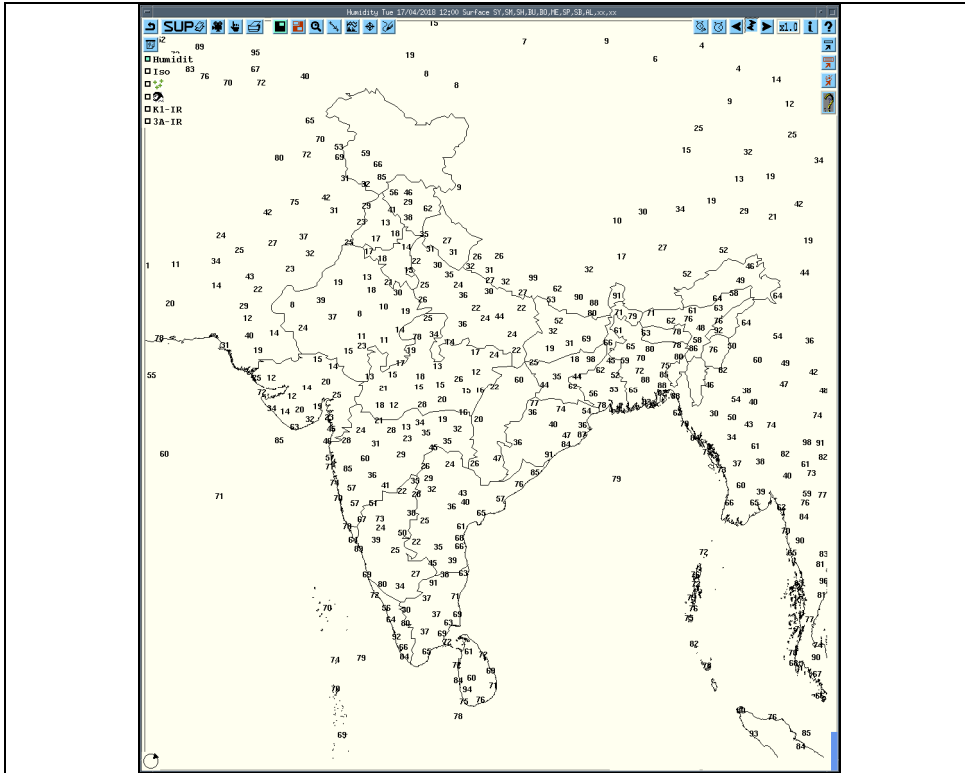
**MSLP**



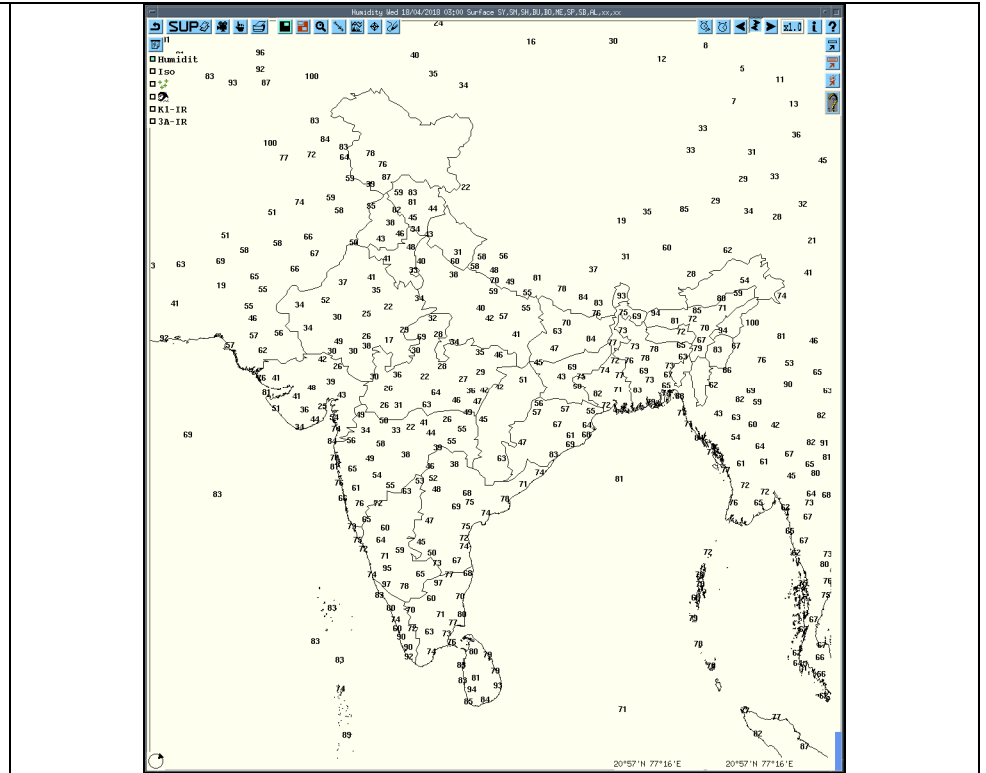
**Departure MSLP**



**Tendency MSLP**



**RH at 12UTC yesterday**



**RH at 03UTC today**



**Past 24 hours DWR Report:**

| <b>Radar Station Name</b> | <b>Date</b> | <b>Time Interval Of Observation (UTC)</b> | <b>Organisation 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>  |
|---------------------------|-------------|---|--|--|----------------|---|--|
| Patna                     | 18/04/18    | 170300-170412                             | NIL  | N/A  | N/A            | N/A                                     | N/A  |
|                           |             | 170412-170602                             | Single Cell Lat-27.38N, Long-84.52E<br>Maximum Reflectivity: 49.5 dBZ<br>Echo Top: 11 KM   | Range: 208.1 KM from DWR Patna in NW direction<br>Movement: North Westerly   | N/A            | Thunderstorm                            | West Champaran   |
|                           |             | 170602-171102                             | NIL  | N/A  | N/A            | N/A                                     | N/A  |
|                           |             | 171102-171432                             | Isolated Multiple Cells<br>Lat-27.33N, Long-84.63E<br>Maximum Reflectivity: 51 dBZ<br>Echo Top: 14 KM<br>Lat-26.78N, Long-85.37E<br>Maximum Reflectivity: 52.5 dBZ<br>Echo Top: 12 KM<br><br>Lat-26.46N, Long-85.98E<br>Maximum Reflectivity: 46.5 dBZ<br>Echo Top: 8 KM<br>Lat-26.15N, Long-87.26E<br>Maximum Reflectivity: 52.5 dBZ<br>Echo Top: 13 KM<br><br>Lat-26.14N, Long-86.84E<br>Maximum Reflectivity: 50.5 dBZ<br>Echo Top: 12.5 KM | Range: 200.4 KM from DWR Patna in NW direction<br>Movement: North Westerly<br>Range: 136.8 KM from DWR Patna in NE direction<br>Movement: North Westerly<br><br>Range: 133.3 KM from DWR Patna in NE direction<br>Movement: North Westerly<br><br>Range: 227.3 KM from DWR Patna in NE direction<br>Movement: North Westerly<br><br>Range: 186.8 KM from DWR Patna in NE direction<br>Movement: North Westerly | N/A            | Thunderstorm                            | West Champaran, East Champaran, Sheohar, Sitamadhi, Madhepura, Purnea, Madhubani, Supaul, Araria, Katihar, Bhagalpur |
|                           |             | 171432-180300                             | NIL  | N/A  | N/A            | N/A                                     | N/A  |
|                           |             | 180300-180400                             | NIL  | N/A  | N/A            | N/A                                     | N/A  |
| Lucknow                   | 18/04/18    | NIL                                       | NIL  | NIL  | NIL            | NIL                                     | NIL  |

| 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            | 17-04-18   | 0302 – 0821  | NIL   | NIL  | NOSIG ECHO  | NIL                              | NIL                |
|                    |  | 0821-1712  | 1. Isolated cell developed at a position 24.326 N/ 86.964 E/ 324.3 Degree/ 241.2 km away from radar transformed into big cell with maximum reflectivity of 61.5 dBz at 0901 UTC and maximum height of 7.12 Km at 0901 UTC | North (241.2 km) Moving in SE-ward direction.  | 1.Cell started forming at 0821 UTC at NW (241.2 Km) from radar. Matured and dissipated at 1122 UTC in N at a distance of 180.9 Km from Radar.   | Thunderstorm / Rain              | N/A                |
|                    |  |  | 2. Isolated cell developed at a position 22.721 N/ 86.091 E/ 274.7 Degree/ 232.7 km away from radar transformed into big cell with maximum reflectivity of 60.0 dBz at 0941 UTC and maximum height of 6.42 Km at 0941 UTC | W (232.7km) moving in SE-ward direction  | 2. Cell started forming at 0821 UTC at W (232.7 Km) from radar. Matured and dissipated at 1252 UTC in SSW at a distance of 169.1 Km from Radar. | Thunderstorm / Rain              | N/A                |
|                    | 3. Isolated cell developed at a position 23.456 N/ 87.494 E/ 318.4 Degree/ 132.0 km away from radar transformed into big cell with maximum reflectivity of 62.0 dBz at 1011 UTC and maximum height of 17.73 Km at 1321 UTC | NW (132.0km) moving in SE-Ward direction   | 3.Cell started forming at 0921 UTC at NW (132.0 Km) from radar Matured and crossed Indo-B'Desh border at 1632 UTC in SSE-direction 83.8 km from Radar.  | Thunderstorm / Rain  | N/A   |                                  |                    |
|                    |  | 4.Series of Multi cell developed from position 22.537 N/ 87.447 E/ 337.2 Degree/ 237.4 km to 23.575N/88.595E/012.1deg/114.4 Km away from radar at 1532 UTC, Max Height 8.5 km and Max reflectivity 52.5 dbZ at 1541 UTC. | 4.NNW to NNE (237.4km to 114.4 km) moving ESE-Ward direction  | 4.Cells started forming at 1532 UTC at NNW (237.4 Km) to NNE(114.4km)from radar did not Mature and crossed Indo-B'Desh Border at 1712 UTC in NNE-direction ,156.9 km from Radar. | Thunderstorm / Rain   | N/A                              |                    |
|                    |  | 1713---2400  | NIL   | NIL  | NOSIG ECHO  | NIL                              | NIL                |
|                    | 18-04-18   | 0000—0300  | NIL   | NIL  | NOSIG ECHO  | NIL                              | NIL                |

| Radars station name | Date     | Time interval of observation (utc) | Organization of the 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                                      |
|---------------------|----------|------------------------------------|--|---|--|------------------------------------|---|
| Agartala            | 18-04-18 | 170300-180300                      | Multiple cells with moderate intensity are found over b/desh and adjoining tripura at 170312z, 55 dbz, about 14 kms.                                     | About 50 to 200 kms, north, north-west and north-north-west, 30 kmph, nw-ly | Disipated over tripura and hills of meghalaya and mizoram at 171242z | Thunderstorm accompanied with rain | Mostly all the districts of tripura and adjoining areas |
|                     |          |                                    | Multiple cells are found over b/desh and parts of meghalayan hills at 180132z, 40 dbz, about 10 kms.   | 100 to 200 kms nw & nnw. 30 kmph nw-ly                                      | Persists over b/desh, 80 to 100kms north of agartala at 180302z      | Not known                          |   |
| Jaipur              | 18-04-18 | 170300-180300                      | Nil  | Nil   | Nil  | Nil                                |   |
| Patiala             | 18-04-18 | 170300 - 170600                    | MULTIPLE ECHOES REFLECTIVITY: 46.0 DBZ HT. 7-10 KM   | NE ,E SECTORS MOVEMENT- E WARD  | -  | -                                  | Ambala, Chandigarh                                      |
|                     |          | 170600 - 170900                    | ISOLATED CELL DBZ : 46.5 HT.: 05-08 KMS  | NE SECTOR ,MOVEMENT NE WARD   | -  | -                                  | Nabha   |
|                     |          | 170900-171200                      | MULTIPLE CELLS DBZ : 46.0 HT.: 10-11 KMS   | NE,SW SECTORS,MOVEMENT NE WARDS   | -  | --                                 | Gangotri, Dalhousie, Rohru, Simla, Rampur, Halwar a     |
|                     |          | 171200 - 171500                    | MULTIPLE ECHOES DBZ : 43.5 DBZ HT. 10-11 KM  | NE,SE SECTORS MOVEMENT NE WARDS   | -  | --                                 | Mandi, Bhunther, Utter Kashi, Pehowa                    |
|                     |          | 171500 - 180252                    | NO ECHO  | -   | -  | -                                  | -   |

| <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             | 18-04-18    | 170900                                    | Multiple CB cells with Max. reflectivity of 57dBz and height of 13 KM   | W(172 KM) and moving SEly  | CB cells are forming at 0801UTC and developing.                                    | -                                       | East Godavri, Visakhapatnam (AP) and Koraput (Orissa)                    |
|                           |             | 171200                                    | Multiple CB cells with Max. reflectivity of 58dBz and height of 14 KM   | NW(96 KM), W(92 Km) and moving SEly                                    | CB cells are forming since last observation and dissipating started from 1121 UTC. | Thunder and lightening                  | East Godavri, Visakhapatnam, Vizianagaram (AP) and Nabarangapur (Orissa) |
|                           |             | 171500                                    | Multiple cb cells(NW) with max reflectivity 60dbz and height 12kms  | Formed since last observation (12:01 UTC)(149KM S) NW and moving SE ly | Cb cells also formed NE WITH 52DBZ ,247kms.  | -                                       | Koraput,(ODISSA)vizianagaram, (AP)Nabarangapur(Orissa)                   |
|                           |             | 171800                                    | CB cell NE ly with max reflectivity 47dbz with height 8kms.   | 247kms (NE) and moving SE ly.  | Cb visible in the range at 15:21 UTC and reported 16:01 UTC                        | -                                       | NAYAGARH, KHURDHA, GOPALAPUR (ODISSA)                                    |
|                           |             | 180000                                    | Conviction region NORTH ly with reflectivity 29dbz 4kms.  | 18:01UTC 128KMS. Moving SEly.  | -  | -                                       | -  |

### 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 Commencement (IST) | Time of end (IST)    |
| Baderwah  | Northwest India   | Jammu & Kashmir             | Thunderstorm                            | 17-04-18    | 0945                       | 1330                 |
| Churk   | Northwest India   | East Uttar Pradesh          | Thunderstorm                            | 17-04-18    | 1520                       | 1550                 |
| Pantnagar   | Northwest India   | Uttarakhand                 | Thunderstorm                            | 17-04-18    | 0915                       | 1015                 |
| Mukteshwar  | Northwest India   | Uttarakhand                 | Thunderstorm                            | 17-04-18    | 1225                       | 1245                 |
| Tehri   | Northwest India   | Uttarakhand                 | Thunderstorm                            | 17-04-18    | 0820<br>1320<br>1705       | 0910<br>1540<br>1910 |
| Gangtok   | East India        | Sikkim                      | Thunderstorm                            | 17-04-18    | 1350                       | 1630                 |
| Tadong  | East India        | Sikkim                      | Thunderstorm                            | 17-04-18    | 1350                       | 1610                 |
| Malda   | East India        | Sikkim                      | Thunderstorm                            | 17-04-18    | Occurred                   |                      |
| Alipore   | East India        | Sikkim                      | Thunderstorm                            | 17-04-18    | 1921                       | 2028                 |
| <b>Alipore</b>  | <b>East India</b> | <b>Gangetic West Bengal</b> | <b>Squall(Dir-NW, max. speed 84Kmph</b> | 17-04-18    | <b>1942</b>                | <b>1943</b>          |
| <b>Alipore</b>  | <b>East India</b> | <b>Gangetic West Bengal</b> | <b>Squall(Dir-NW, max. speed 98Kmph</b> | 17-04-18    | <b>1955</b>                | <b>1957</b>          |
| DumDum  | East India        | Gangetic West Bengal        | Thunderstorm                            | 17-04-18    | 1845                       | 2045                 |
| <b>DumDum</b>   | <b>East India</b> | <b>Gangetic West Bengal</b> | <b>Squall(Dir-NW, max. speed 98Kmph</b> | 17-04-18    | <b>2014</b>                | <b>2015</b>          |
| Diamond Harbour   | East India        | Gangetic West Bengal        | Thunderstorm                            | 17-04-18    | 1900                       | 1940                 |
| Diamond Harbour   | East India        | Gangetic West Bengal        | Thunderstorm                            | 17-04-18    | 0600                       | 0720                 |
| Haldia  | East India        | Gangetic West Bengal        | Thunderstorm                            | 17-04-18    | 0612                       | 0655                 |
| Digha   | East India        | Gangetic West Bengal        | Thunderstorm                            | 17-04-18    | 1710                       | 1810                 |
| Asansol   | East India        | Gangetic West Bengal        | Thunderstorm                            | 17-04-18    | 1450                       | 1600                 |
| Purnia  | East India        | Bihar                       | Thunderstorm                            | 17-04-18    | 1910                       | 1930                 |
| Ranchi  | East India        | Jharkhand                   | Thunderstorm                            | 17-04-18    | 1850                       | 1940                 |
| Jamshedpur  | East India        | Jharkhand                   | Thunderstorm                            | 17-04-18    | 1400                       | 1530                 |
| Bhubaneswar   | East India        | Odisha                      | Thunderstorm                            | 17-04-18    | 1935                       | 2125                 |
| Balasure  | East India        | Odisha                      | Thunderstorm                            | 17-04-18    | 1650                       | 1800                 |
| Jharsuguda  | East India        | Odisha                      | Thunderstorm                            | 17-04-18    | 1635<br>2040               | 1750<br>2100         |
| Chandbali   | East India        | Odisha                      | Thunderstorm                            | 17-04-18    | 1915                       | 1945                 |
| Keonjhar  | East India        | Odisha                      | Thunderstorm                            |             | 1625                       | 1800                 |
| Ambikapur   | Central India     | Chhattisgarh                | Thunderstorm                            | 17-04-18    | 1345                       | 1630                 |
| Jagdapur  | Central India     | Chhattisgarh                | Thunderstorm                            | 17-04-18    | 1705                       | 1742                 |
| Silchar   | Northeast India   | Assam                       | Thunderstorm                            | 17-04-18    | 17/1135                    | 17/1500              |
| Tezpur  | Northeast India   | Assam                       | Thunderstorm                            | 18-04-18    | 18/0700                    | 18/0800              |
| Dhubri  | Northeast India   | Assam                       | Thunderstorm                            | 17-04-18    | 17/0840,<br>17/1120        | 17/0922,<br>17/1130  |
| Barapani  | Northeast India   | Meghalaya                   | Thunderstorm                            | 17-04-18    | 17/1250                    | 17/1445              |
| Shillong  | Northeast India   | Meghalaya                   | Thunderstorm                            | 17-04-18    | Reported at 12Z Synop      |                      |
| Imphal  | Northeast India   | Manipur                     | Thunderstorm                            | 17-04-18    | Reported at 12Z Synop      |                      |
| Kailasahar  | Northeast India   | Tripura                     | Thunderstorm                            | 17-04-18    | 17/1002                    | 17/1340              |
| Agartala  | Northeast India   | Tripura                     | Thunderstorm                            | 17/18-04-18 | 17/1250,<br>17/1335        | 17/1350,<br>18/0210  |

| 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 Commencement (IST) | Time of end (IST) |
| Thiruvananthapuram City   | South India | Kerala                   | Thunderstorm                   | 17-04-18 | 1405                       | 1605              |
| Panambur  | South India | Coastal Karnataka        | Thunderstorm                   | 18-04-18 | 0321<br>0446               | 0411<br>0505      |
| Bajpe   | South India | Coastal Karnataka        | Thunderstorm                   | 18-04-18 | 0228                       | 0440              |
| Belgaum AP  | South India | North interior Karnataka | Thunderstorm                   | 17-04-18 | 1515<br>1725               | 1615<br>1840      |
| Kalaburgi   | South India | North interior Karnataka | Thunderstorm                   | 17-04-18 | 1935                       | 2210              |
| Panambur  | South India | Coastal Karnataka        | Thunderstorm                   | 18-04-18 | 0321<br>0446               | 0411<br>0505      |
| Kanyakumari   | South India | South Tamilnadu          | Thunderstorm                   | 18-04-18 | 0800                       | 0900              |

### **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(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

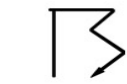
[http://satellite.imd.gov.in/mAndhra\\_Pradesh\\_skm2.html](http://satellite.imd.gov.in/mAndhra_Pradesh_skm2.html)



## WEATHER SYMBOLS:



+ thunderstorm



+ heavy thunderstorm



sandstorm or dust storm



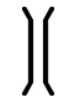
squall



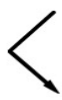
hail shower



tropical storm



+ tornado



+ lightning



+ hurricane

www.visualdictionaryonline.com



haze



smoke



dust or sand storm



fog



drizzle



rain



snow



showers



hail



thunderstorm

### **Weather Symbols**