



# India Meteorological Department

## FDP STORM Bulletin No. 42 (17-04-2018)

### 1. CURRENT SYNOPTIC SITUATION:

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

- ♦ The Western Disturbance as an upper air cyclonic circulation over north Pakistan & neighbourhood extending upto 3.1 km above mean sea level persists.
- ♦ A fresh Western Disturbance is likely to affect Western Himalayan region & adjoining plains from 19th onwards.
- ♦ The cyclonic circulation over northeast Rajasthan & adjoining Haryana extending upto 0.9 km above mean sea level now lies over south Haryana & neighbourhood. A trough at 0.9 km above mean sea level runs from this cyclonic circulation to East Vidarbha across central parts of Madhya Pradesh.
- ♦ A trough runs from northeast Uttar Pradesh to Manipur across Meghalaya at 0.9 km above mean sea level.
- ♦ The cyclonic circulation over Sub-Himalayan West Bengal & neighbourhood persists and now extends upto 0.9 km above mean sea level and lies embedded in the above trough.
- ♦ The trough of low at mean sea level over Equatorial Indian Ocean & adjoining southeast Arabian Sea with the cyclonic circulation aloft extending upto 1.5 km above mean sea level now lies over Equatorial Indian Ocean & adjoining Southwest Arabian Sea.
- ♦ The other trough of low at mean sea level over Equatorial Indian Ocean & adjoining central parts of south Bay of Bengal with the embedded cyclonic circulation extending upto 3.1 km above mean sea level now lies over Equatorial Indian Ocean & adjoining Southwest Bay of Bengal off south Sri Lanka coast.
- ♦ The north-south wind discontinuity from north Madhya Maharashtra to interior Tamilnadu across interior Karnataka at 0.9 km above mean sea level now runs from North Madhya Maharashtra to Rayalaseema across North Interior Karnataka.
- ♦ A cyclonic circulation extending up to at 0.9 km above mean sea level lies over north Kerala coast and neighbourhood.

#### 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 North Afghanistan adjoining North Pakistan, Jammu & Kashmir over the area between lat 37.0°N to 50.0°N, long 64.5°E to 100.0°E in association with another WD over the area.

##### Westerly Trough & Jet Stream:

Trough in westerlies runs roughly along long 65.0E & north of lat 28.0N.

**Convective Activity:**

Convective cells that developed over extreme South Tripura and adjoining Bangladesh (**Minimum CTT Minus 85 Deg C**) Central Madhya Maharashtra (**Minimum CTT Minus 83 Deg C**). A New Cell Is Developing Over North Andhra Pradesh (**Minimum CTT Minus 74 Deg C**) Southeast Jharkhand adjoining Odisha (**Minimum CTT Minus 43 Deg C**), North Nagaland (**Minimum CTT Minus 42 Deg C**). Convective Clouds weakened over North Coastal Kerala, South Coastal Karnataka, and Lakshadweep.

**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 West Jammu & Kashmir, North Himachal Pradesh, extreme South Tripura, South Mizoram, Central Madhya Maharashtra, Southwest Coastal Karnataka, Kerala, Coastal Tamilnadu, South Andaman Islands and Lakshadweep.

**Clouds descriptions within India:**

Broken low/medium clouds with embedded moderate to intense convection seen over Jammu & Kashmir, North Himachal Pradesh. Scattered low/medium clouds with embedded moderate to intense convection seen over North Andhra Pradesh, North Central & North Interior Karnataka, North Central Karnataka, Lakshadweep, South Andaman Islands and isolated Jharkhand, extreme South Tripura, South Mizoram and isolated over Madhya Maharashtra, rest Kerala, Coastal Karnataka and North Telangana. Scattered low/medium clouds with embedded weak to moderate convection seen over rest Himachal Pradesh and Uttarakhand. Scattered low/medium clouds with embedded isolated weak to moderate convection seen over Chhattisgarh, Odisha, Sikkim, Sub Himalayan West Bengal and rest Northeast states. Scattered low/medium clouds seen over West Haryana, East Uttar Pradesh, rest Maharashtra, Southeast Gujarat and Madhya Pradesh.

**Arabian Sea:-**

Scattered low/medium clouds with embedded moderate to intense convection seen over area south of Lat 11.5° N.

**Bay of Bengal & Andaman Sea:**

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

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

Moderate to Intense convection was observed over J&K South Kerala adjoining Tamilnadu North Coastal Andhra Pradesh South Interior Karnataka South Coastal Karnataka adjoining Kerala and Weak to Moderate convection observed over Himachal Pradesh Uttarakhand Sikkim Sub Himalayan West Bengal Meghalaya.

**OLR:-**

Up-to 230wm<sup>-2</sup> observed over Jammu & Kashmir North Himachal Pradesh North Uttarakhand Sikkim Arunachal Pradesh and Up-to 250wm<sup>-2</sup> observed over South Coastal Karnataka Kerala Tamilnadu Meghalaya Assam Nagaland North Manipur.

**Synoptic Features (Westerly Trough & Jet Stream):** Trough in Westerly's roughly along Longitude 65.0E & north of Latitude 28.0N

**Dynamic Features:**

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

A **positive Vorticity** field at 850 hPa is observed over J&K Himachal Pradesh Uttarakhand Punjab Haryana Uttar Pradesh Coastal Karnataka Tamilnadu & Kerala.

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

Rainfall upto 20-50 mm observed over some parts of North-West Jammu & Kashmir Kerala South Interior Karnataka West Tamilnadu North Coastal Andhra Pradesh (.)

Upto 01-10 mm observed over rest J&K South Himachal Pradesh North Uttarakhand Sub Himalayan West Bengal Meghalaya Nagaland.

**RADAR and RAPID RGB Observation:**

Isolated/multiple moderate to strong echoes (dBZ around 45-55 and height around 10-15km) are seen in domain of DWR Kolkata, Paradeep, Gopalpur, Hyderabad and isolated/multiple light echoes in domain of Agartala, Patiala, Srinagar at around 1730IST.

RAPID RGB Satellite imagery at 1600IST indicates significant convection over Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Southeast Uttar Pradesh, Central Assam, Nagaland, Mizoram, South Tripura, East Madhya Pradesh, North & South Chhattisgarh, Madhya Maharashtra, Marathawada, Southeast Vidarbha adjoining Telangana, 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	17.04.2018	18.04.2018
PM10 (micro-g/m <sup>3</sup> )	237	214
PM2.5 (micro-g/m <sup>3</sup> )	103	93

**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 deep trough and associated strong winds over Bangladesh and adjoining NE region

**Confluence & wind Discontinuity regions: 12 UTC of Day 0-2:** 925hPa N-S discontinuity over Southern Peninsular India and in Day 1-2 SW-NE discontinuity over MP Chhattisgarh & Odisha

**Synoptic Systems: 00 UTC of Day 3-4:** WD as a deep trough at 500 hPa over J & K and adjoining Pakistan.

**00UTC of Day 2-5:** 925 hPa anticyclone over Bay of Bengal In Day 3-5 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 0-3:** Nil **Day 3:** Over Gujarat & Rajasthan associated with approaching WD

### 3. Convergence at 850 hPa:

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

Day0: NE NMMT, East MP, Vidarbha, NI Karnataka, SI Karnataka,

Day1: Assam Meghalaya, NE NMMT, Jharkhand, Madhya Maharashtra, SI Karnataka,

Day2: Uttarakhand, Madhya Maharashtra, Tamilnadu, Puducherry, NI Karnataka, SI Karnataka,

Day3: Assam Meghalaya, Gangetic WB, Jharkhand, West UP, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, East MP, Madhya Maharashtra, Chhattisgarh, Telangana, NI Karnataka,

Day4: Assam Meghalaya, Gangetic WB, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka,

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

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

Day0: Jharkhand, Bihar, Uttarakhand,

Day1: Assam Meghalaya, Sub Himalayan WB, Gangetic WB, Bihar, East UP, West UP, Uttarakhand, Himachal Pradesh, Jammu Kashmir,

Day2: Assam Meghalaya, Sub Himalayan WB, Jharkhand, Bihar, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Tamilnadu, Puducherry,

Day3: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Bihar, West UP, Punjab, Jammu Kashmir, West Rajasthan, Chhattisgarh,

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, East UP, Uttarakhand, Himachal Pradesh, Odisha, Konkan Goa, Madhya Maharashtra, Coastal AP, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day1: 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, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day2: 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,

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

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Uttarakhand, Odisha, Tamilnadu, Puducherry, Coastal Karnataka, 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, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan, , Odisha, Konkan Goa, Madhya Maharashtra, Chhattisgarh,

Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Konkan Goa, Madhya Maharashtra, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Coastal Karnataka, NI Karnataka,

Day2: Arunachal Pradesh, Sub Himalayan WB, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha, Konkan Goa, Madhya Maharashtra, Chhattisgarh, Coastal AP, Telangana, Rayalseema, Coastal Karnataka, NI Karnataka, SI Karnataka,  
Day3: Arunachal Pradesh, Sub Himalayan WB, Bihar, East UP, West UP, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, Chhattisgarh, SI Karnataka,

Day4: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Uttarakhand, Himachal Pradesh, Jammu Kashmir,

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

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

Day0: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, Uttarakhand, Odisha, Konkan Goa, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalseema, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, Uttarakhand, Odisha, Konkan Goa, Madhya Maharashtra, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalseema, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day2: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Jammu Kashmir, Odisha, Chhattisgarh, Coastal AP, Telangana, Rayalseema, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day3: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Chhattisgarh, Coastal AP, Telangana, Rayalseema, Tamilnadu, Puducherry, Coastal Karnataka, SI Karnataka, Kerala,

Day4: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Odisha, Chhattisgarh, Coastal AP, Telangana, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

## **8. Rainfall and thunder storm activity:**

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

Day1: 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, Sub Himalayan WB, Himachal Pradesh, Jammu Kashmir,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Uttarakhand, Himachal Pradesh, Jammu Kashmir,

Day5: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Jammu Kashmir,

## **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 South Haryana and adjoining areas. The forecast shows it will become less marked in next 24 hours. The analysis shows a trough extends from this cyclonic circulation southwards up to East Vidarbha across central parts of Madhya Pradesh. The forecast shows south-eastward shift of the trough till day 3. The analysis also shows a trough in the lower troposphere extending from northeast Uttar Pradesh to Manipur and adjoining areas. It will persist for next 72 hour forecast. The cyclonic circulation over SHWB and adjoining areas is embedded in the above trough. The analysis shows a north- south Trough runs from north Madhya Maharashtra to Rayalaseema across north interior Karnataka. The forecast shows it will persist till day3. A feeble cyclonic circulation is seen in the analysis over coastal Kerala and adjoining areas. The forecast shows it will become less marked in next 24 hours.

## 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 along the cyclonic circulation over Haryana and adjoining areas on day1. It is inferred that GWB, NE states, Orissa and adjoining areas has Positive Vorticity from day 1 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, extreme south peninsular India, Assam, Meghalaya, Tripura and adjoining area, SHWB on all 3 days; over parts of South west Rajasthan on day 3; Maximum value of the index is seen over parts of GWB, Orissa, Jharkhand, Andhra Pradesh, coastal Maharashtra, Konkan and Goa, Chhattisgarh and Telangana during next 3 days; over parts of Karnataka and Rayalaseema on day 2 and 3; over parts of Bihar and adjoining areas 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, Bihar, Jharkhand, Vidarbha, Orissa, GWB, SHWB, Sikkim and NE states on all 3 days; over parts of J&K, Rajasthan, Punjab, Haryana, Delhi, Uttarakhand, Himachal Pradesh, Uttar Pradesh and adjoining Madhya Pradesh on day1; over parts of east Uttar Pradesh and south west Rajasthan on day 3; maximum negative value of the index less than -10 is seen over parts of GWB on day 1; over parts of GWB, Orissa and coastal Andhra Pradesh on day 2.

**Total Total Index (> 50):** The threshold value of the index is > 50 over parts of Uttarakhand, Rajasthan, Gujarat, southern parts of Uttar Pradesh, Madhya Pradesh, Vidarbha, northern parts of Marathwada and Chhattisgarh on day 1; over most of the parts of the country on day 2 and 3 except J&K, NE states and Extreme south Peninsular India; maximum value of the index >60 is seen over parts of Rajasthan, west Uttar Pradesh, Madhya Pradesh, Chhattisgarh and Vidarbha during next 3 days; over parts of Gujarat, Bihar, Jharkhand, Orissa, Telangana and Marathwada on day 2; over parts of Punjab, Haryana, Himachal Pradesh, Uttarakhand, Bihar, Jharkhand, GWB, Orissa, Telangana, Madhya Maharashtra, Marathwada, Andhra Pradesh on day 3.

**Sweat Index (> 300):** Although the threshold value of the Index >300 is seen in most parts of the country during next 3 days but the maximum value of the index greater than 800 is seen over parts of GWB, Tripura and adjoining areas on day 1; over parts of GWB, Orissa, Tripura and adjoining areas on day 2.

**CAPE (> 1000):** Mostly in areas of southern peninsular India, along west coast and east coast and parts of GWB, Orissa, Andhra Pradesh, Telangana, Kerala, Tamil Nadu, Karnataka, Gujarat, coastal Maharashtra, Konkan and Goa, Jharkhand, GWB, SHWB, Assam, Tripura and adjoining areas during all 3 days; over parts of Bihar adjoining areas on day2 and 3; over some parts of East Uttar Pradesh and Chhattisgarh 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 and coastal Maharashtra during next 3 days; over parts of Karnataka, Konkan and Goa, coastal Kerala on day 2; over parts of Karnataka, coastal Kerala and parts of Jharkhand 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 south east Rajasthan and West Madhya Pradesh on day 1 and J&K, Punjab, Himachal Pradesh, Uttarakhand, Haryana, Delhi, Northern parts of Rajasthan, west Uttar Pradesh, Madhya Pradesh, northern parts of Chhattisgarh, Madhya Maharashtra and Marathwada during day 2 and 3, the maximum value of the index > 400 is seen over parts of SHWB, Bihar and Jharkhand on day 1.

### **5. Rainfall Activity:**

40-70 mm Rainfall: over parts of Tripura and adjoining areas on day2.

10- 40 mm Rainfall: over parts Jammu and Kashmir, Karnataka, Kerala, Sikkim and NE states during next 3 days.

Up to 10 mm rainfall: Over parts of J&K, Foothills of Himalaya, Punjab, Haryana, 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, NE states on all 3 days; over parts of Delhi, Uttar Pradesh, west Madhya Pradesh, Marathwada, Madhya Maharashtra, Vidarbha on day 1; over southern parts of Madhya Maharashtra on day 2; over parts of Delhi and 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, Himachal Pradesh, East Uttar Pradesh, Uttarakhand, Orissa, GWB, North & South interior Karnataka adjoining south Madhya Maharashtra, Telangana, Assam, Meghalaya, Tripura and adjoining areas on day 1; over parts of J&K, Himachal Pradesh, Sikkim, NE states, North & South interior Karnataka, GWB, Orissa, Bihar, Jharkhand, SHWB on day 2; over parts of J&K, Punjab, Himachal Pradesh, Uttarakhand, south interior Karnataka, Kerala, Tamil Nadu, Assam, Meghalaya, Tripura, Mizoram and adjoining areas on day 3; maximum value of the Model reflectivity is seen over parts of 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, southern parts of Maharashtra, Konkan and Goa, Sikkim and NE states during all 3 days; below threshold value is seen over some parts of Orissa and Telangana on day 1; over parts of Bihar, Jharkhand and GWB on day 2 and 3; maximum value of the index is seen over parts of J&K, Punjab, Haryana, Delhi, Rajasthan, Gujarat, Madhya Pradesh, Chhattisgarh, Jharkhand, Vidarbha, east and west Uttar Pradesh, GWB, Madhya Maharashtra, Marathwada and Orissa during all 3 days; over parts of Bihar on day 1 and 2; over parts of Andhra Pradesh 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, Bihar, Jharkhand, Chhattisgarh, Orissa, GWB and Kolkata, SHWB, parts of Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Telangana, Extreme south peninsular India, Assam, Tripura and adjoining areas on all 3 days; over parts of Vidarbha on day 1 and 3; over parts of East Uttar Pradesh on day 3; Maximum value of the index greater than 3500 is seen over the parts of coastal Karnataka, south interior Karnataka, coastal Kerala, coastal Orissa, coastal Andhra Pradesh, coastal Maharashtra, Konkan and Goa, GWB for next 3 days; over parts of Jharkhand and Telangana on day 2; over parts of Telangana and south Madhya Maharashtra 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 during day 1; on day 2 and 3 over most of the parts of country except Haryana, Rajasthan, Madhya Pradesh, Eastern parts of Gujarat, north Chhattisgarh, Vidarbha, north

Madhya Maharashtra and Marathwada and west Uttar Pradesh; the maximum value of the index > 400 is seen over Gujarat, west Uttar Pradesh, Bihar, Jharkhand, GWB, Orissa, Chhattisgarh, Vidarbha, Telangana, Northern parts of Coastal Maharashtra and Andhra Pradesh on day 1; over parts of Gujarat, Coastal Maharashtra, Chhattisgarh, Orissa, Vidarbha, Telangana and Andhra Pradesh on day 2; over parts of Gujarat, Andhra Pradesh, GWB, Orissa, Telangana and northern parts of Madhya Maharashtra on day 3.

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

70- 130 mm Rainfall: over parts of Assam Tripura and adjoining areas on day 2 and 3; over parts of J&K on day 2; over southern parts of Karnataka and adjoining areas on day 3.

40-70 mm Rainfall: over some parts of Tripura on day 1; over parts of J&K, Tripura and adjoining areas on day 2 and 3; over southern parts of Karnataka and adjoining areas on day 3.

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

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

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

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

- Synoptic analysis indicates that a trough runs from northeast Uttar Pradesh to Manipur across Meghalaya and the cyclonic circulation over SubHimalayan West Bengal & neighbourhood persists and lies embedded in the above trough. This will give thunderstorm with gusty winds activity over Bihar, Jharkhand, SHWB and Assam, Meghalaya on Day-1.
- The north south wind discontinuity from North Madhya Maharashtra to Rayalaseema across North Interior Karnataka and a cyclonic circulation lies over north Kerala coast and neighbourhood. This will trigger the thunderstorm with gusty winds activity over North and South Interior Karnataka, Tamilnadu, Kerala on Day-1. This activity may continue to Day-2 over the same region.
- A fresh Western Disturbance is likely to affect Western Himalayan region & adjoining plains from 19th onwards



## Day-1 & Day-2:

### Significant Rainfall:

Nil

### Thunderstorm with Squall/Gusty winds:

Jammu & Kashmir  
Assam, Meghalaya, Nagaland, Manipur, Mizoram & Tripura  
Sub-Himalayan West Bengal & Sikkim, Gangetic West Bengal,  
Jharkhand, Bihar, Odisha,  
Chhattisgarh, Vidarbha  
Madhya Maharashtra, Marathwada, Konkan & Goa  
Interior Tamilnadu, Kerala, Interior Karnataka,  
North Coastal Andhra Pradesh

### Thunderstorm with squall & Hailstorm:

Nil

### Significant Rainfall:

Nil

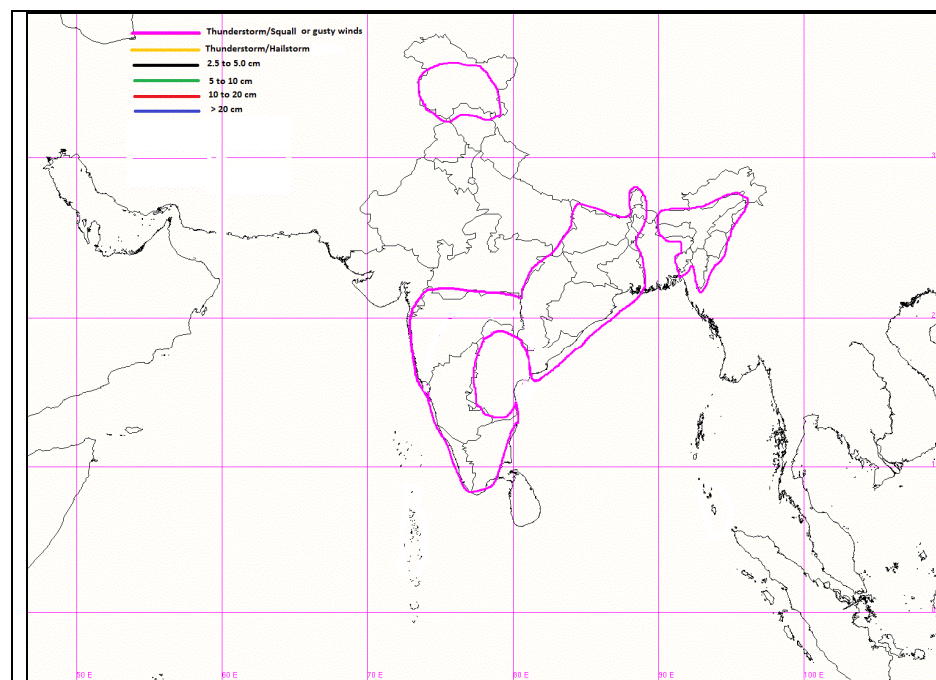
### Thunderstorm with Squall/Gusty winds:

Jammu & Kashmir  
Nagaland, Manipur, Mizoram & Tripura  
Gangetic West Bengal, Odisha  
Marathwada  
Interior Tamilnadu, Kerala, Interior Karnataka,  
North Coastal Andhra Pradesh, Telangana

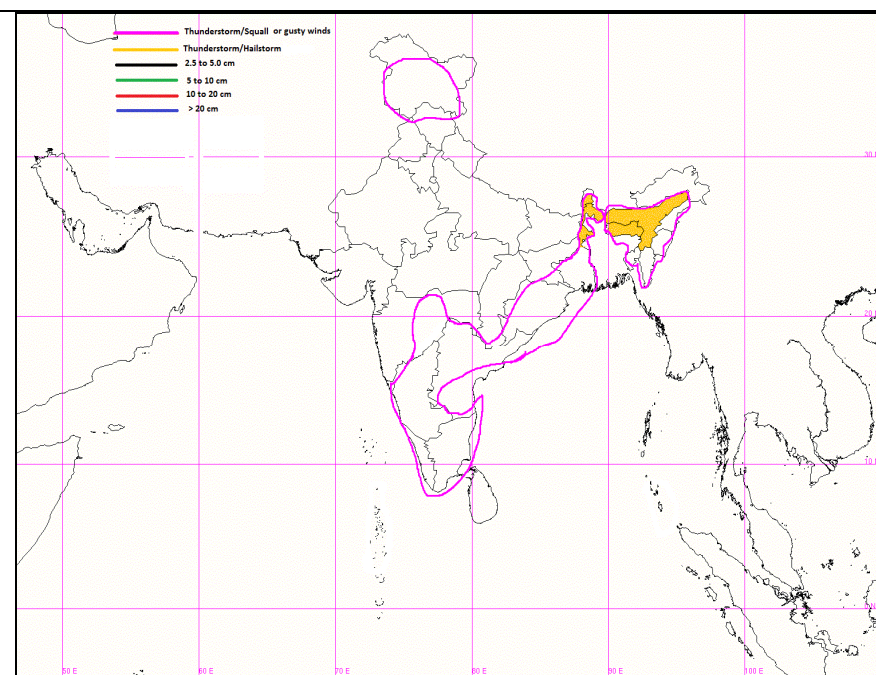
### Thunderstorm with Squall & Hailstorm:

Assam & Meghalaya  
Sub-Himalayan West Bengal & Sikkim

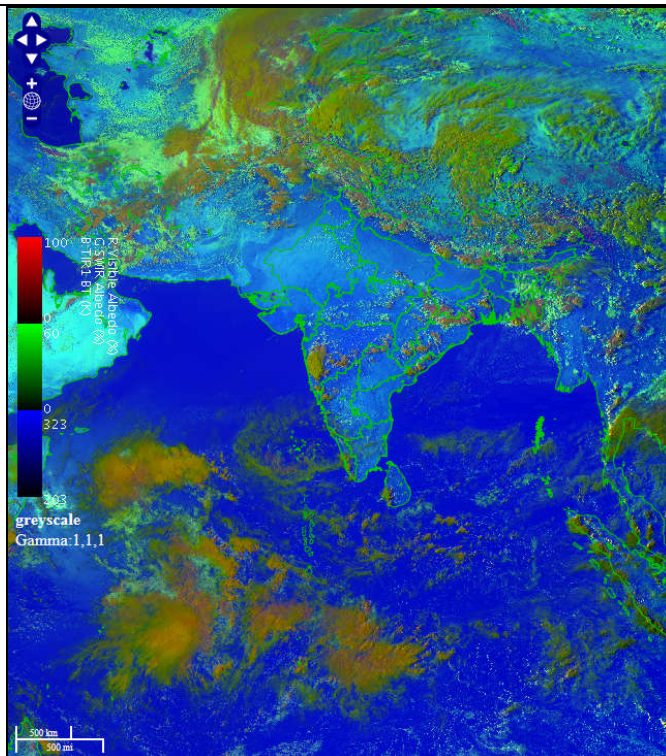
## Graphical Presentation of Potential Areas for Severe Weather:



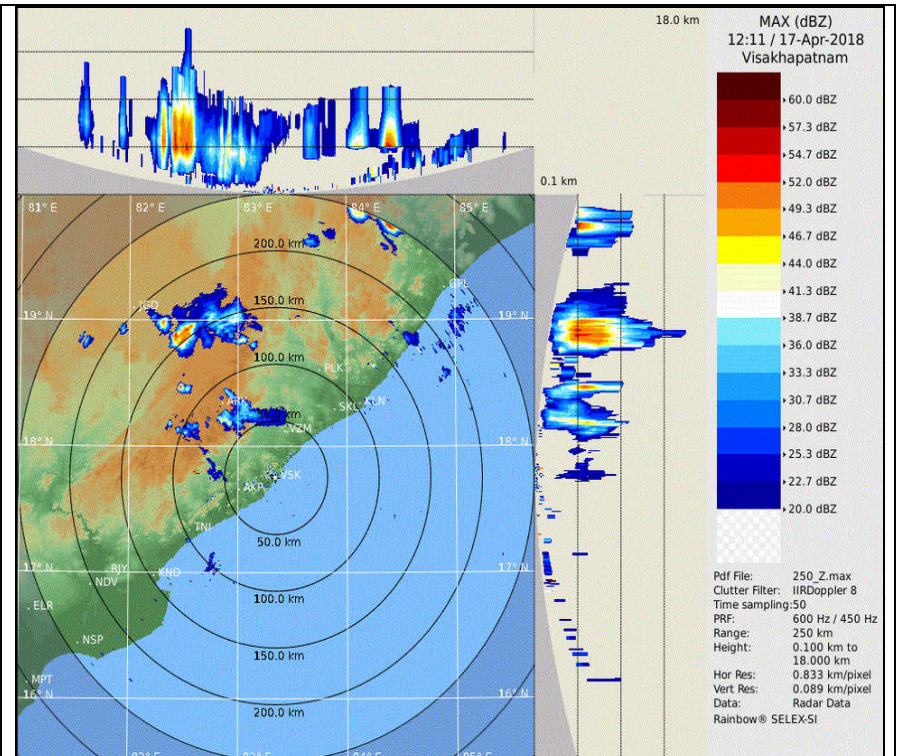
IOP Advisory for 24 hours



IOP Advisory for 48 hours

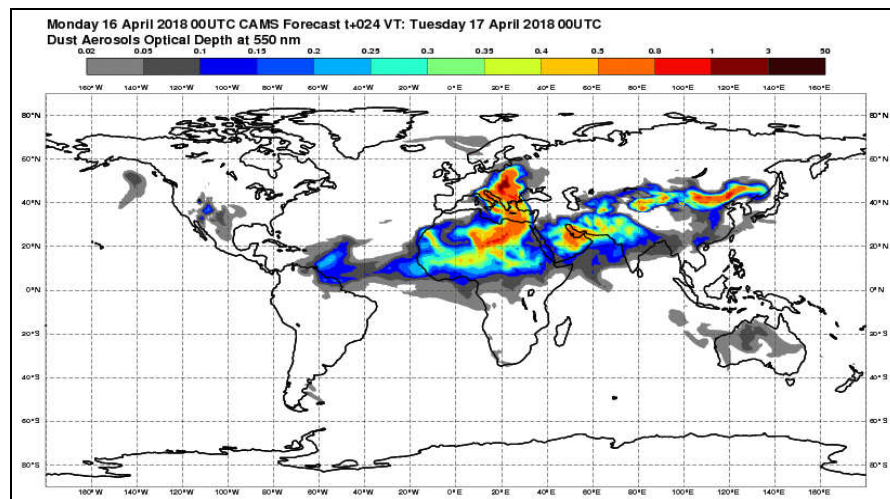


**RAPID RGB Imagery at 1600 IST of the Day**

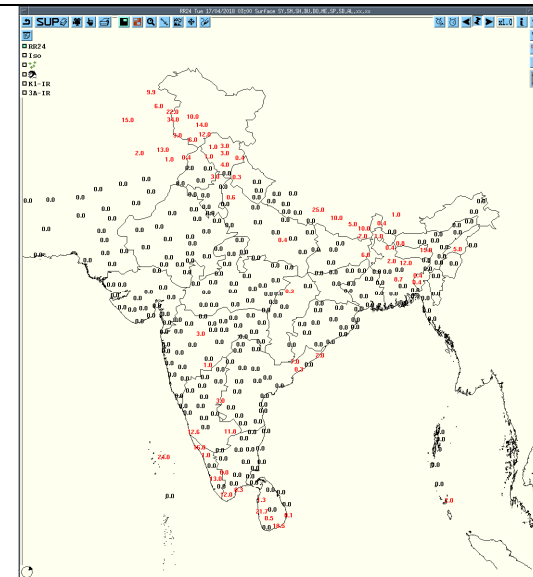


**DWR Vishakhapatnam at 1741 IST of the Day**

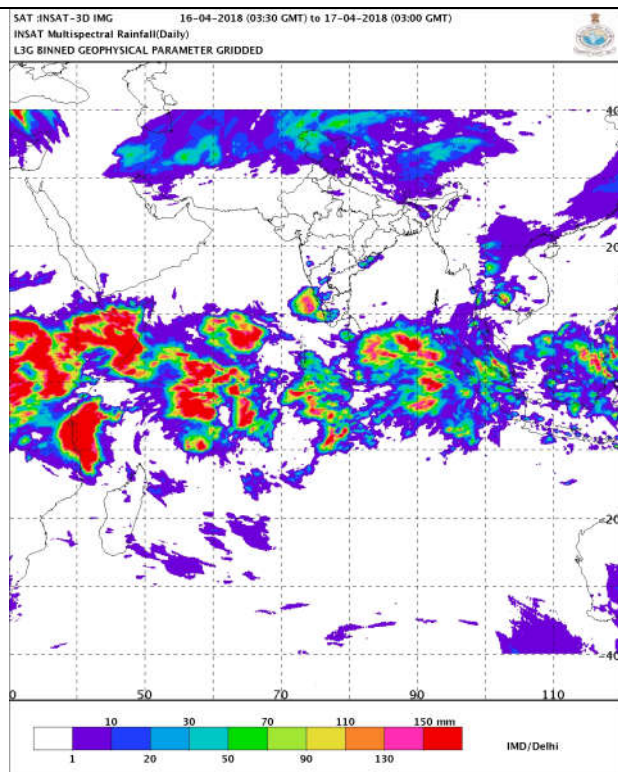




## Dust Forecast

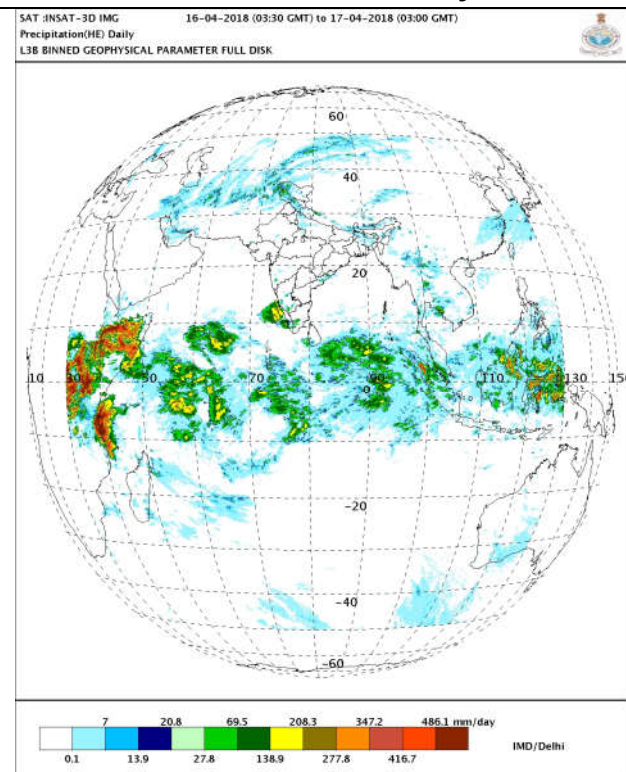


**Accumulated 24 Hour rainfall (in red) recorded  
at 0300UTC of today**

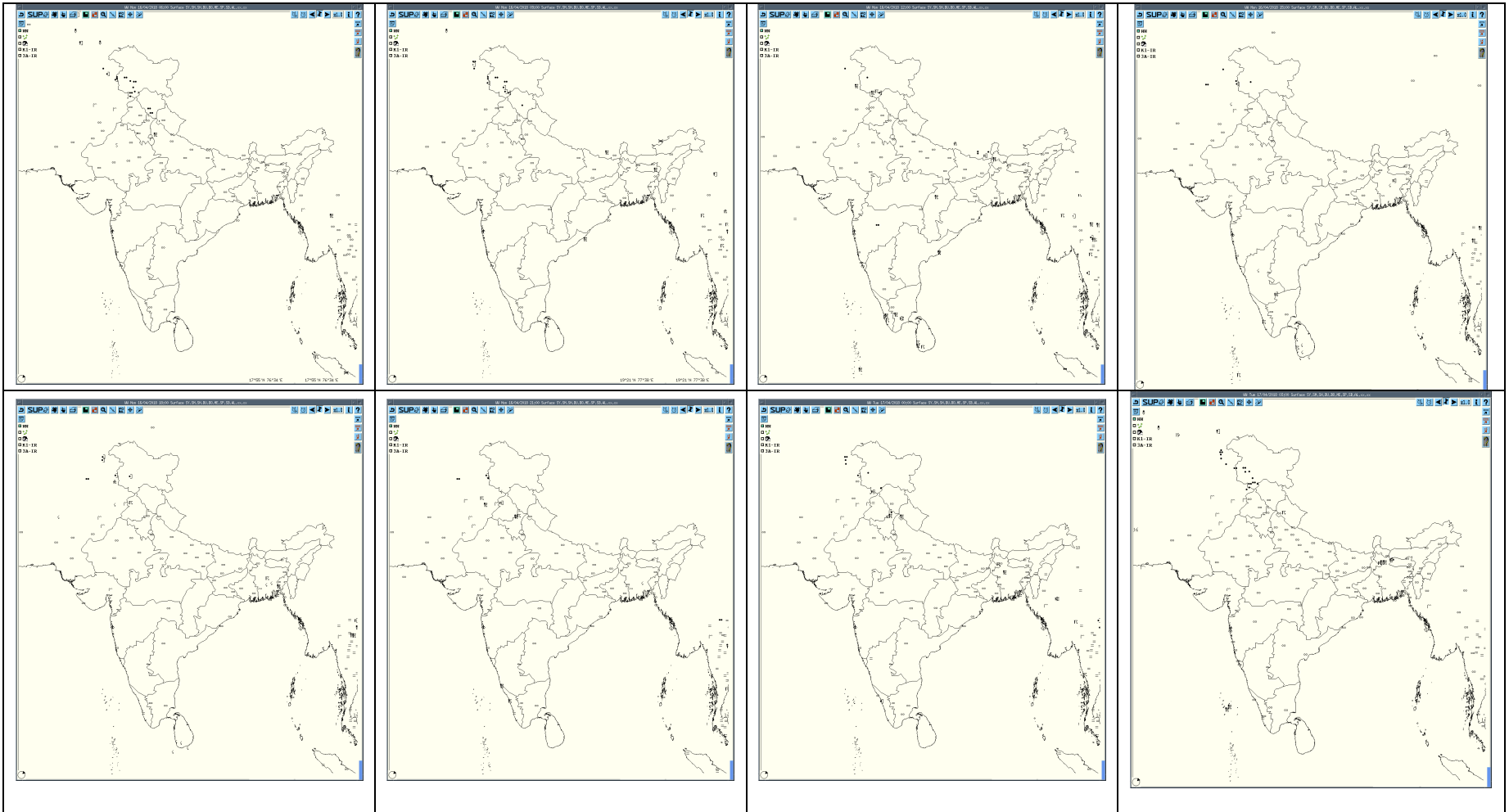


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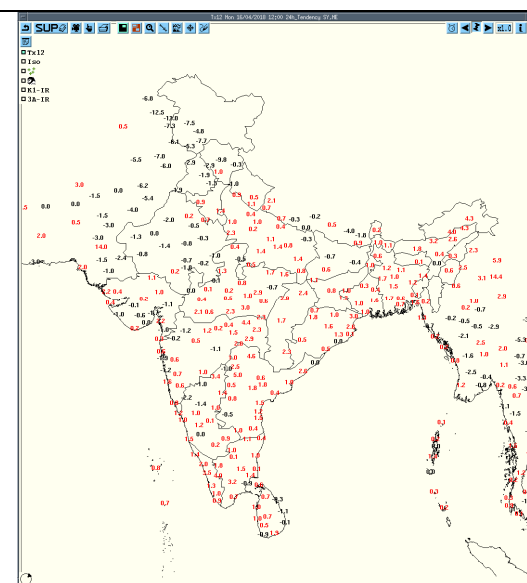
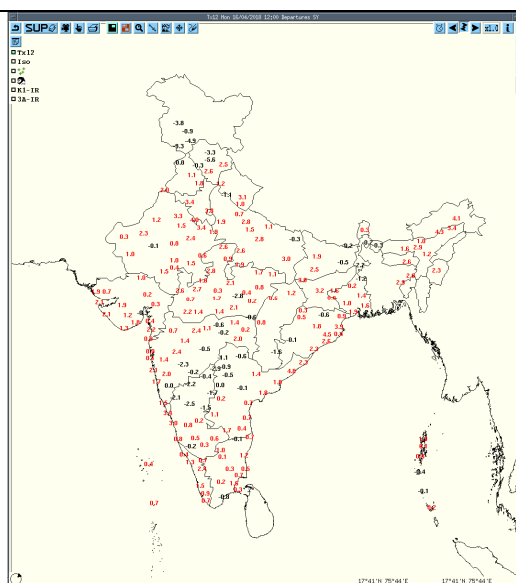
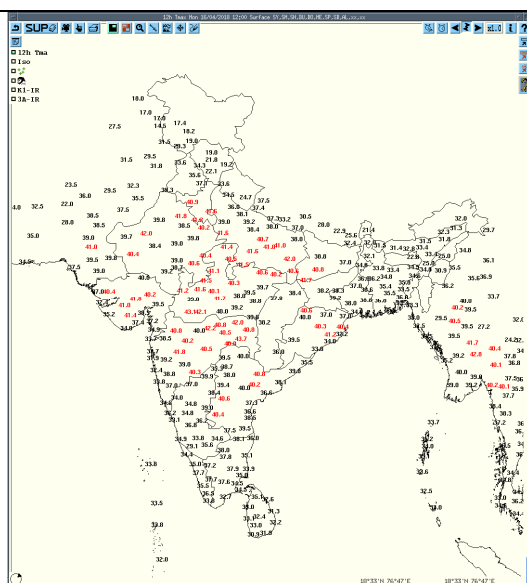
**IMR**



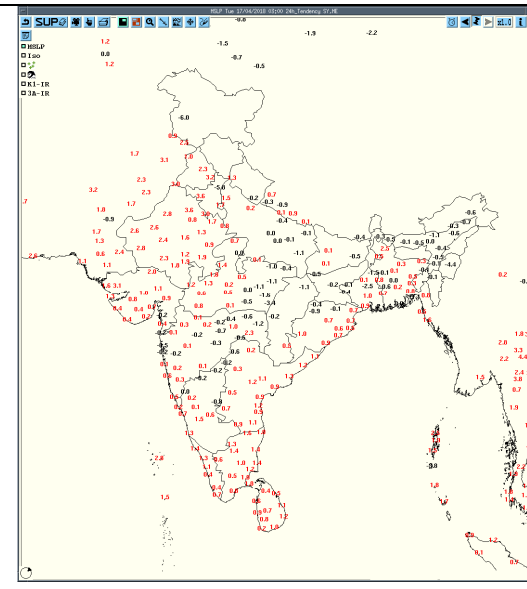
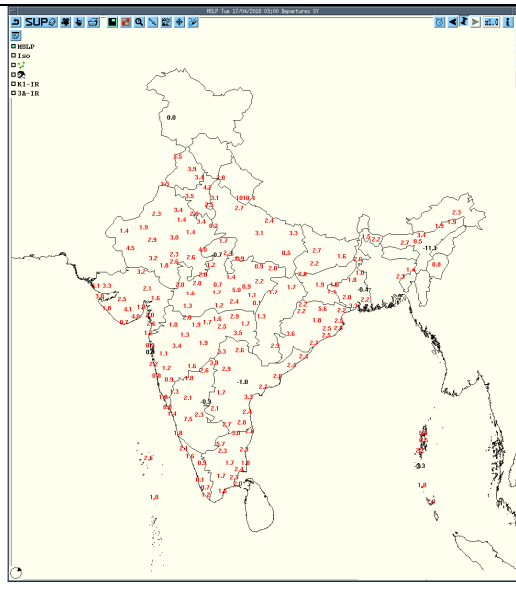
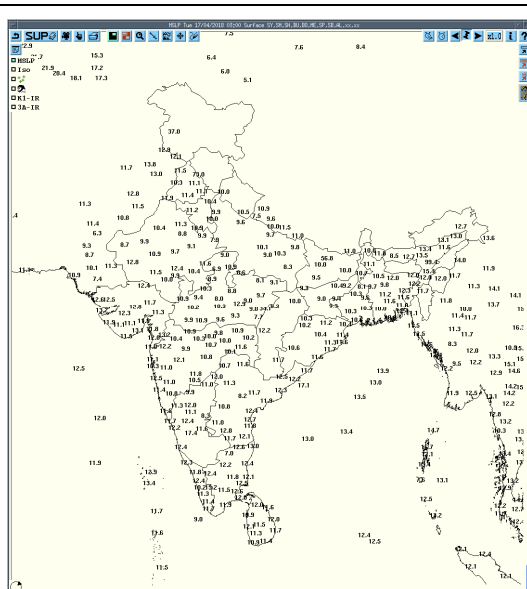
**HEM**



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



**Tmax**

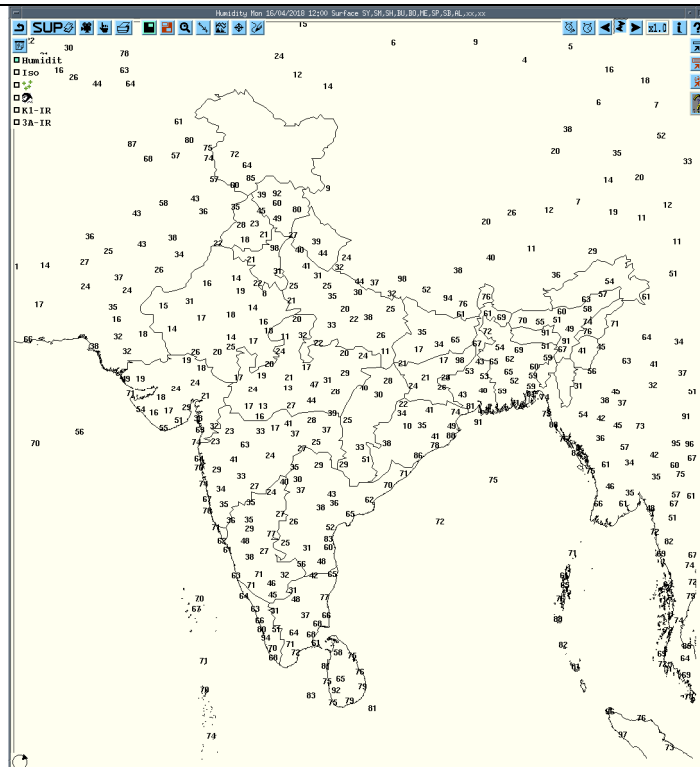


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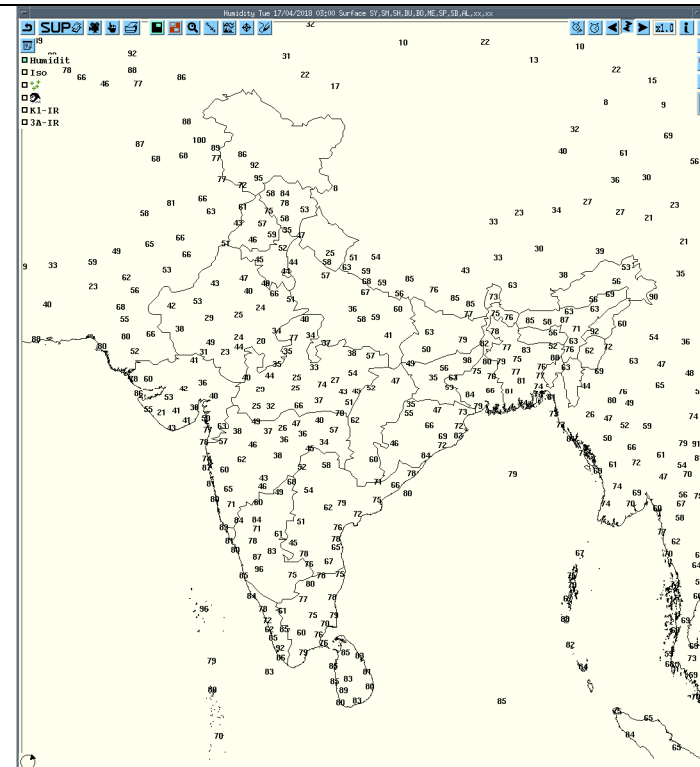
**MSLP**

Departure MSLP

## Tendency MSLP



**RH at 12UTC yesterday**



**RH at 03UTC today**



## Past 24 hours DWR Report:

DWR Station	Date	Time interval of observation	Organization of the cells ( isolated single cell/multiple cells convective regions/squall lines) with height of 20 dBZ echo top and maximum reflectivity	Formation w.r.t. radar station & direction of movement	Remarks	Associate d severe weather, if any	Districts affected
Jaipur	17-04-18	16/1122-1552	Multiple cell with average height of 6.0 km & maximum reflectivity 52.00 dBZ	Multiple cell develop from 11:22 UTC of 16/04/2018 towards NW, N,NE of Jaipur and moved to E,NE Wards at speed 15-20 km/hr.	Multiple cell develop from 11:22 UTC of 16/04/2018 towards NW,N NE of Jaipur and reaches maximum reflectivity during 13:12 UTC to 13:32 UTC of 16/04/18 and died down at 15:52	Thunderstorm/ dust storm with Light rain at Isolated places.	Sikar, Alwar, Bharatpur Districts.
Patna	17-04-18	160300-161530	NIL	NIL	NIL	NIL	NIL
		161530-172030	MULTI CELL E-TOP-10 KM Lat-26.11 E Long-86.84 N LOCATION-ENE MAXIMUM dBZ-52.0	Range-185.2 MOVEMENT –S.E.	NIL	Thundersquall Lightning	Madhubani,Darbhanga,Saharsa,Supaul,Madhepura,Araria,Purnia,Khagadia,Katihar,Bhagalpur,Kishanganj,Bank
		172030-170300	NIL	NIL	NIL	NIL	NIL
Visakhapatnam		1650900	Isolated single cells with Max. reflectivity of 49dBz and height of 9 KMS	NE(160 KMS) SEly	CB cells are forming at 0641UTC and developing.		Srikakulam Dist. (AP) Gajapati Dist. (Orissa)
		161200	Multiple cells with Max. reflectivity of 65dBz and height of 18 KMS	NE(68-200 KMS) W(66-125 KMS) and SW(95-208 KMS) moving SEly	During the period CB cells developing to matured level, dissipating and again developing.		Srikakulam, Vizianagaram, Visakhapatnam, East and West Godavari Dist. (AP) Khammam Dist(Telangana) Gajapati Dist. (Orissa) Bastar dist(Chhatisgarh)
		161500	Multiple cb cells with Max. reflectivity of 60dBz and height of 15 kms	WSW(55 kms) moving SEly	Since last observation and cb cells started dissipating.		Visakhapatnam, East Godavari Dist
		161800	Isolated cb cell with Max. reflectivity of 55dBz and height of 7 KMS	NW(152 KMS) moving Sly	Isolated cb cell developed at 1511 UTC , dissipated at 1531 UTC		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	16-04-2018	0302 – 0812	NIL	NIL	NOSIG ECHO	NIL	NIL
		0821 – 1121	1.Isolated single cell with maximum reflectivity of 56.0 dBz at 0851 UTC and maximum height of 11.73 Km at 0851 UTC	SW (238.4 km) almost stationary.	Isolated single cell formed at 0821 UTC in SW at a distance of 238.4 km from radar. Not matured and dissipated at 0911 UTC in SW at a distance of 243 Km from Radar.	Thunderstorm / Rain	N/A
			2 . Isolated single cell with maximum reflectivity of 65.0 dBz at 0931 UTC and maximum height of 15.49 Km at 0951 UTC	NNW (218.1 km) moving in ESE-wards direction.	Isolated single cell formed at 0831 UTC in NNW at a distance of 218.1 km from radar. Changed to multi celled system. Matured and split into cell no. 3 and 4 at 1011 UTC in NW at a distance of 178.5 Km from Radar.	Thunderstorm /Hail / Rain	N/A
		0821 – 1121	3.Isolated cell with maximum reflectivity of 52.0 dBz at 1051 UTC and maximum height of 11.91 Km at 1011 UTC	NNW (213.0 km) moving in ENE-wards.	Isolated single cell formed by splitting of cell no. 2 at 1011 UTC in NNW at a distance of 213.0 km from radar. Not matured and dissipated at 1121 UTC in N at a distance of 222 Km from Radar.	Thunderstorm / Rain	N/A
			4. Isolated single cell with maximum reflectivity of 60.0 dBz at 1011 UTC and maximum height of 8.6 Km at 1011 UTC	NW(169.2 km) moving in ESE-wards	Isolated single cell formed by splitting of cell no. 2 at 1011 UTC in NW at a distance of 169.2 km from radar. Matured and dissipated at 1042 UTC in NNW at a distance of 142 Km from Radar.	Thunderstorm / Rain	N/A
	17-04-2018	1131 – 2400	NIL	NIL	NOSIG ECHO	NIL	NIL
		0001-0301	NIL	NIL	NOSIG ECHO	NIL	NIL

Radar 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	17/04/18	160300 to 170300	Multiple Cells Are Found Over Meghalaya Hills At 160542z, 55 dBZ, About 14 Kms.	About 180 To 200 Kms, North, 30 Kmph, W-Ly.	Dissipated Over Meghalaya Hills At 161352 Z	Not Known	
			Multiple Cells Are Found Over Meghalaya Hills And Part Of B/Desh At 160912z, 55 dBZ, About 14 Kms.	About 180 To 200 Kms, North-West, 30 Kmph, Nw-Ly.	Persists Over B/Desh And Neighbouring Areas With Moderate Intensity At 161402z	Not Known	
			Multiple Cells Are Found Over B/Desh At 170242z, 55 dBZ, About 14 Kms.	About 50 To 200 Kms, North-West And North-North-West, 30 Kmph, Nw-Ly	Persists Over B/Desh And Neighbouring Areas With Moderate Intensity At 170302z	Not Known	
Patiala	17/04/18	16/0900-1200	ISOLATED CELL DBZ : 45.5 HT.: 07-09KMS	SW SECTOR MOVEMENT- SE WARD	TS/RA	Kaithal	
		16/1200 - 1500	Multiple echoes Reflectivity: 50.0 dBZ Ht. 8-10 km	SW sector Dir. SE ly	TS/RA	Hissar, Jind, Maham	
		16/1500 - 1800	NO ECHO	-	-	-	
		16/1800 - 2100	Multiple echoes Reflectivity: 57.5 dBZ Ht. 09-13 km	NW SECTOR MOVE. EAST WARD	TS/RA	Nabha, Khanna, Ludhiana, Phillaur	
		16/ 2100-0000	Multiple echoes Reflectivity: 58.5 dBZ Ht. 09-10 km	NW,NE SECTOR MOVE. EAST WARD	TS/RA	Ludhiana, Khanna, Patiala, Nawasher, Sirhans, Chandigarh	
		17/0000-0252	Multiple echoes Reflectivity: 46.0 dBZ Ht. 07-10 km	NE,E Sectors Dir. E ly	RA/DZ	Ambala. Rajpura, Chandigarh	

## 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)
Tehri	Northwest India	Uttarakhand	Thunderstorm	16-04-18	1150	1340
Dehradun	Northwest India	Uttarakhand	Thunderstorm	17-04-18	0435	0535
Alwar	Northwest India	East Rajasthan	Thunderstorm	16-04-18	1830	1900
Ambala	Northwest India	Haryana	Thunderstorm	17-04-18	0240 0420	0330 0540
Karnal	Northwest India	Haryana	Thunderstorm	16-04-18	0930	1015
Chandigarh	Northwest India	Chandigarh	Thunderstorm	17-04-18	0245	0350
Amritsar AP	Northwest India	Punjab	Thunderstorm	16-04-18	1757	2020
Patiala	Northwest India	Punjab	Thunderstorm	17-04-18	0145	0315
Banihal	Northwest India	Jammu & Kashmir	Thunderstorm	17-04-18	0210	0250
Quazigund	Northwest India	Jammu & Kashmir	Thunderstorm	17-04-18	0130	0330
Batote	Northwest India	Jammu & Kashmir	Thunderstorm	16-04-18	1545	1820
Katra	Northwest India	Jammu & Kashmir	Thunderstorm	16/17-04-18	161630 170550	161805 170700
Gangtok	East India	Sikkim	Thunderstorm	16-04-18	2020	2030
Coohbehar	East India	Sub Himalayan West Bengal	Thunderstorm	17-04-18	0630	0640
Jagdalpur	Central India	Chhattisgarh	Thunderstorm	16-04-18	1800	1900
Pendra Road	Central India	Chhattisgarh	Thunderstorm	16-04-18	1600	1725
Dhubri	Northeast India	Assam	Thunderstorm	17-04-18	0645	0750
Barapani	Northeast India	Meghalaya	Thunderstorm	16-04-18	1415	1720
Cherrapunjee	Northeast India	Meghalaya	Thunderstorm	16-04-18	1442	1610
Shillong	Northeast India	Meghalaya	Thunderstorm	16-04-18	1300	1630
Agartala	Northeast India	Tripura	Thunderstorm	16-04-18	1540	1710
CIAL Kochi	South India	Kerala	Thunderstorm	16-04-18	1630	1810
Karipur A P	South India	Kerala	Thunderstorm	17-04-18	0140	0258
Kozhikode	South India	Kerala	Thunderstorm	17-04-18	0115	0300
Agathi	Lakshadweep	Lakshadweep	Thunderstorm	17-04-18	0730	0830
Amini	Lakshadweep	Lakshadweep	Thunderstorm	17-04-18	0630	0830
Kalingapatnam	South India	Andhra Pradesh (CAP)	Thunderstorm	16-04-18	1400	1545
Tuni	South India	Andhra Pradesh (CAP)	Thunderstorm	16-04-18	1515	1620
Visakhapatnam	South India	Andhra Pradesh (CAP)	Thunderstorm	16-04-18	1840	1940
Kakinada	South India	Andhra Pradesh (CAP)	Thunderstorm	16-04-18	1600	1745
Panambur	South India	Coastal Karnataka	Thunderstorm	17-04-18	0115	0345
Bajpe	South India	Coastal Karnataka	Thunderstorm	17-04-18	0130	0420
Gadag	South India	North Interior Karnataka	Thunderstorm	16-04-18	1830	1930
Bangalore	South India	South Interior Karnataka	Thunderstorm	16-04-18	1900	2045
<b>Bangalore</b>	<b>South India</b>	<b>South Interior Karnataka</b>	<b>Squall( Dir-SW, max, speed 44kmph)</b>	<b>16-04-18</b>	<b>At 1915</b>	

## 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)

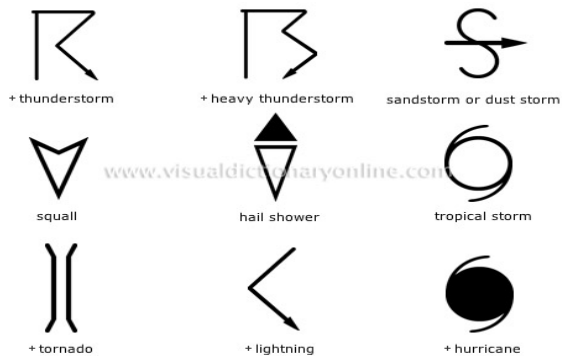
For Radar images of the past 24 hours including mosaic of images:

[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>	