



# India Meteorological Department

## FDP STORM Bulletin No. 29 (04-04-2018)

### 1. CURRENT SYNOPTIC SITUATION:

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

- ♦ The Western Disturbance as a trough in mid tropospheric westerlies roughly along Long 60°E to the north of Lat. 30°N now seen as an upper air cyclonic circulation over north Pakistan & neighbourhood at 3.1 km above mean sea level and is feeble.
- ♦ A cyclonic circulation extending upto 0.9 km above mean sea level lies over Punjab and adjoining north Pakistan.
- ♦ A trough at 0.9 km above mean sea level runs from the above cyclonic circulation to North Interior Karnataka across northeast Rajasthan, West Madhya Pradesh, western parts of Vidarbha and Marathwada.
- ♦ The north south trough from west Madhya Pradesh to north Kerala coast has merged with the above trough.
- ♦ The cyclonic circulation extending upto 1.5 km above mean sea level over Haryana and neighbourhood has also merged with the above trough.
- ♦ A trough in easterlies at 1.5 km above mean sea level runs from Comorin area to South Interior Karnataka across interior Tamilnadu.
- ♦ The cyclonic circulation over northeast Jharkhand and adjoining Gangetic West Bengal persists and now lies between 1.5 & 3.1 km above mean sea level.
- ♦ The remnant Western Disturbance as a trough in mid & upper tropospheric westerlies now runs with its axis at 7.6 km above mean sea level from east Arunachal Pradesh to north Bay of Bengal across Assam and Bangladesh.

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

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

##### Western Disturbance (WD):

Scattered multi/layered clouds seen over Caspian Sea, West Iran, West Persian Gulf, & neighbour in association with WD over the area.

**Westerly Trough:** Trough in westerlies runs roughly along long 60.0°E & north of lat 30.0°N.

##### Clouds descriptions within India:

Scattered low/medium clouds with embedded moderate to intense convection seen over Andaman Islands. Scattered low/medium clouds with embedded isolated weak to moderate convection seen over Jammu & Kashmir, Uttarakhand, South Chhattisgarh, North Odisha, South Jharkhand, Meghalaya, Nagaland, Manipur and East Madhya Pradesh. Scattered low/medium clouds seen over Karnataka, North Coastal Andhra Pradesh, Kerala and Tamilnadu.

**Arabian Sea:**

Isolated low/medium clouds with embedded moderate to intense convection seen over Southwest Arabian Sea and Scattered low/medium clouds with embedded weak to moderate convection seen over West Central and Northwest Arabian Sea.

**Bay of Bengal & Andaman Sea:**

Scattered low/medium clouds with embedded weak to moderate convection seen over East Andaman Sea.

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

Moderate to Intense convection was observed over J&K Himachal Pradesh Uttarakhand South Chhattisgarh Coastal Odisha Telangana Andhra Pradesh South Interior Karnataka Kerala Tamilnadu and weak to moderate convection observed over North Rajasthan Punjab Haryana Delhi North-West Uttar Pradesh Sikkim North-East States

**OLR:**

Upto  $230 \text{ w m}^{-2}$  was observed over J&K Himachal Pradesh Uttarakhand and

Upto  $250 \text{ w m}^{-2}$  observed over South Punjab Sikkim Arunachal Pradesh Meghalaya Nagaland Manipur Mizoram.

**Synoptic features: Trough in Westerlies:** roughly along Longitude  $60.0^{\circ}\text{E}$  & north of Latitude  $30.0^{\circ}\text{N}$ .

**Dynamic Features:-**

Low to Medium wind shear is observed over India.

Positive shear tendency is observed over India.

A positive Vorticity field is observed over Uttar Pradesh Maharashtra Jharkhand.

Negative Low Level Convergence observed over Bihar North-East States and Positive Low Level Convergence is observed over rest India.

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

Rainfall upto 10-20 mm observed over North Himachal Pradesh North Uttarakhand and

Rainfall upto 1-10 mm observed over J&K East Arunachal Pradesh Meghalaya Nagaland Mizoram Coastal Odisha North Coastal Andhra Pradesh South Chhattisgarh South Interior Karnataka Kerala South Tamilnadu.

**HEM:**

Rainfall upto 70-139 mm observed over North Uttarakhand and

Rainfall upto 28-70 mm observed over South-West J&K North Himachal Pradesh and

Rainfall upto 14-20 mm observed over North Arunachal Pradesh Meghalaya Nagaland Manipur South Interior Karnataka West Tamilnadu and

Rainfall upto 01-14 mm observed over South Chhattisgarh Coastal Odisha North Coastal Andhra Pradesh Kerala.

**Convective Activity (During Last 24 hrs):**

CELL NO.	DATE/ TIME (UTC)	AREA/ LOCATION	MINIMUM CTBT (MINUS DEG C)	MOVEMENT/ REMARKS
1	03/0900	S CHTGH COTL ORS ADJ N COTL AP	50	DEVELOPING
	1000	DO	60	EXPANDING
	1100	DO	60	STATIONARY
	1200	COTL ORS ADJ N COTL AP	56	STATIONARY
	1300	DO	50	WEAKENING
	1500	---	-	DISSIPATED
2	03/0900	MEGHA NAGA	40	DEVELOPING
	1000	DO	42	STATIONARY
	1100	MEGHA	40	WEAKENING
	1200	----	---	DISSIPATED
3	03/1000	SIK	55	DEVELOPING
	1100	DO	49	EXPANDING
	1200	---	---	DISSIPATED
4	03/1100	W TN	60	DEVELOPING
	1200	DO	60	STATIONARY
	1300	DO	59	EXPANDING
	1500	W TN	55	WEAKENING
	1700	----	---	DISIPATED

**RADAR and RAPID RGB Observation:**

Moderate to Strong isolated/multiple echoes were seen on DWR Machilipatnam, Vishakhapatnam and Kolkata (dBZ >50 and height around 15km), Moderate isolated/multiple echoes were seen on DWR Hyderabad, Cherrapunjee and Gopalpur (dBZ between 45-50 and height around 15km) at around 1700 IST.

RAPID RGB RAPID RGB Satellite imagery at 1530IST indicates significant convection over West Jammu & Kashmir, Uttarakhand, and Meghalaya adjoining Assam, South Jharkhand, Odisha, East Madhya Pradesh, South Chhattisgarh, North Coastal Andhra Pradesh, Telangana and some isolated places over Karnataka.

**Environmental condition (dust etc) and its forecast based on 00UTC of date:**

Higher Dust concentration was observed over Arab countries and western part of India. Dust concentration is expected to remain same 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	04.04.2018	04.04.2018
PM10 (micro-g/m <sup>3</sup> )	200	208
PM2.5 (micro-g/m <sup>3</sup> )	84	88

## 2. NWP MODEL GUIDANCE:

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

#### 1. Weather Systems:

**Low level CYCIRs, Troughs: 12 UTC of Day 0-1:**

**Confluence & Wind Discontinuity regions: 12 UTC of Day 0-4:** at 925 hPa S-N wind discontinuity over interior peninsula extending SW-NE over Chhattisgarh, Jharkhand and WB region

**Synoptic Systems: 12 UTC of Day 0-4:** At 700 hPa an anticyclone over Gujarat expands and evolves in to an elongated E-W ridge near 20N covering west coast to east coast.

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

#### 3. Convergence at 850 hPa:

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

Day0: Jammu Kashmir, West MP, East MP, Madhya Maharashtra, Chhattisgarh, Coastal AP, Tamilnadu, Puducherry, NI Karnataka, SI Karnataka, Kerala,

Day1: Jharkhand, East RJ, Odisha, West MP, East MP, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Tamilnadu, Puducherry, NI Karnataka, SI Karnataka, Kerala,

Day2: Jharkhand, West RJ, East RJ, Madhya Maharashtra, Vidarbha, Chhattisgarh, Tamilnadu, Puducherry,

Day3: NE NMMT, Jharkhand, Bihar, East UP, Odisha, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Tamilnadu, Puducherry, SI Karnataka, Kerala,

Day4: Jharkhand, East UP, Odisha, East MP, Marathwada, Tamilnadu, Puducherry, SI Karnataka, Kerala,

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

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

Day0: Uttarakhand, Himachal Pradesh, Odisha,

Day1: NE NMMT, Jharkhand, Bihar, East UP, Himachal Pradesh, Odisha, East MP, Coastal AP,

Day2: Gangetic WB, Jharkhand, Bihar, East UP, Himachal Pradesh, Madhya Maharashtra, Coastal AP,

Day3: Jharkhand, Bihar, West UP, Odisha, West MP, Chhattisgarh,

Day4: Jharkhand, Bihar, East UP,

#### 5. Rainfall and thunder storm activity: Day/Index: Subdivisions with Precipitation > 2 cm

Day1: Andaman Nicobar, Kerala,

Day2: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Gangetic WB, Bihar, Andaman Nicobar,

Day3: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Andaman Nicobar,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Gangetic WB, Jharkhand, Bihar, East UP, Odisha, Chhattisgarh, Telangana,

Day5: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, Odisha, Andaman Nicobar,

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

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

Day0: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha, Konkan Goa, Madhya Maharashtra, Coastal AP, Telangana, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Punjab, Jammu Kashmir, Odisha, Madhya Maharashtra, Vidarbha, Coastal AP, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day2: Arunachal Pradesh, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, Uttarakhand, Punjab, Jammu Kashmir, Odisha, Konkan Goa, Madhya Maharashtra, Vidarbha, Chhattisgarh, Coastal AP, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Konkan Goa, Madhya Maharashtra, Chhattisgarh, Coastal AP, Telangana, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Himachal Pradesh, Jammu Kashmir, Odisha, Konkan Goa, Madhya Maharashtra, Vidarbha, Chhattisgarh, Telangana, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

## 7. Spatial distribution of TTI: Day/Index Subdivision with Total Totals Index > 52

Day0: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Jharkhand, Bihar, East UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, Odisha, East MP, Konkan Goa, Madhya Maharashtra, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Coastal Karnataka, NI Karnataka,

Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, Odisha, East MP, Saurashtra Kutch, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, NI Karnataka, SI Karnataka,

Day2: Arunachal Pradesh, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, Gujarat Region, Saurashtra Kutch, Konkan Goa, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Coastal Karnataka, NI Karnataka, SI Karnataka,

Day3: 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, East RJ, Odisha, West MP, East MP, Konkan Goa, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Coastal Karnataka, NI Karnataka, SI Karnataka,

Day4: Arunachal Pradesh, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, East RJ, Odisha, West MP, East MP, Gujarat Region, Saurashtra Kutch, Konkan Goa, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Telangana, Coastal Karnataka, NI Karnataka, SI Karnataka,

## **8. K-Index :- 35[Very Unstable thunderstorm likely]: Day/Index: Subdivisions with K Index > 40**

Day0: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Odisha, Madhya Maharashtra, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day1: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Punjab, Jammu Kashmir, Odisha, Vidarbha, Chhattisgarh, Coastal AP, Tamilnadu, Puducherry, Coastal Karnataka, SI Karnataka, Kerala,

Day2: Arunachal Pradesh, Sub Himalayan WB, Bihar, Uttarakhand, Punjab, Odisha, Konkan Goa, Madhya Maharashtra, Vidarbha, Chhattisgarh, Coastal AP, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, East UP, West UP, Uttarakhand, Odisha, Konkan Goa, Madhya Maharashtra, Chhattisgarh, Coastal AP, Telangana, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day4: Arunachal Pradesh, Sub Himalayan WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Jammu Kashmir, Odisha, Konkan Goa, Madhya Maharashtra, Vidarbha, Chhattisgarh, Telangana, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

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

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

The analysis based on 00 UTC indicates a cyclonic circulation in lower troposphere over Punjab and adjoining North Pakistan it will move eastwards and persists for next 72 hour forecast. A trough from this cyclonic circulation extends southwards up to North Interior Karnataka across Rajasthan, west Madhya Pradesh, West Vidharbha and Marathwada. The forecast shows it will persist for next 3 days. The North- South trough over North Madhya Pradesh up to Kerala and cyclonic circulation over Haryana and adjoining area have merged with the above trough. Another trough is seen in the analysis extending from Madhya Maharashtra up to south Orissa across Vidarbha and Chhattisgarh. Forecast shows it will persist for next 48 hours. Another cyclonic circulation is seen in the analysis over Jharkhand and adjoining area in lower troposphere it will persist for next 3 days.

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

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

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

Mostly over the places along foothills of Himalaya, NE states, Bihar, Jharkhand, adjoining GWB and Orissa on all 3 days. Also found in the vicinity of the North- South trough extending from Punjab up to North Interior Karnataka across Rajasthan; west Madhya Pradesh, West Vidharbha and Marathwada.

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

**T-Storm Initiation Index (> 3):** Higher than a value 3 over coastal areas of Gangetic West Bengal and Kolkata, parts of Orissa, Bihar, Jharkhand, Andhra Pradesh, Telangana, Rayalaseema, Kerala, Karnataka, Tamil Nadu, parts of Gujarat, coastal Maharashtra including Mumbai, Konkan & Goa, Vidarbha adjoining Chhattisgarh, coastal areas along the east coast and west coast, extreme south peninsular India, Tripura and adjoining area, Rajasthan, GWB and SHWB during all 3 days; over parts of J&K, Punjab and Uttar Pradesh on day 1; over parts of south west Rajasthan and East Madhya Pradesh on day 2 and 3; over some parts of West Madhya Pradesh on day 1; Maximum value of the index is seen over parts of Gujarat, northern parts of coastal areas along the west coast, Konkan and Goa, coastal Maharashtra, Orissa, Chhattisgarh, coastal Andhra Pradesh, GWB, Telangana and adjoining area on all 3 days; over parts of Bihar and Jharkhand on day 2 and 3; over parts of south west Rajasthan from day 2 onwards; over parts of east Uttar Pradesh on day 3.

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

**Total Total Index (> 50):** Above threshold value is seen over most of the parts of India except J&K, Himachal Pradesh, Uttarakhand, NE states, extreme southern peninsular India and coastal areas along the east coast and southern part of west coast, Orissa, GWB and SHWB during all 3 days.

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

**CAPE (> 1000):** Mostly in areas of southern peninsular India, along west coast and east coast and coastal areas of GWB, Orissa, Andhra Pradesh, Telangana, Rayalaseema, Kerala, Tamilnadu, Karnataka, Konkan and Goa, Gujarat and coastal Maharashtra, Vidarbha, Bihar, Jharkhand and Chhattisgarh during all 3 days; over parts of south west Rajasthan, Assam, Tripura and adjoining areas on day 2 and 3; over parts of East Madhya Pradesh and East Uttar Pradesh from day 2 onwards; Maximum value of the index greater than 2500 is seen mostly over parts of coastal Orissa, GWB and Gujarat on day 2 and 3. over parts of Andhra Pradesh and Bihar and Jharkhand on day 3.

**CIN (50-150):** Mostly over parts of Gujarat, South West Rajasthan, along east coast along west coast from Saurashtra & Kutch to coastal Karnataka and Kerala, Konkan and Goa, coastal Orissa, Telangana, Rayalaseema, Vidarbha, Andhra Pradesh and GWB, NE states, Bihar, Jharkhand, J&K, Himachal Pradesh, Uttarakhand, East Uttar Pradesh and adjoining Madhya Pradesh, West Uttar Pradesh region during all 3 days, over parts of Punjab, Haryana, Delhi, Himachal Pradesh, North Madhya Pradesh, Uttarakhand on day 1 and 2.

## **5. Rainfall Activity:**

40- 70 mm Rainfall: over some parts of Orissa and GWB on day 2.

10-40 mm Rainfall: over parts of Himachal Pradesh, Uttarakhand, Sikkim, SHWB, NE states and Foothills of Himalaya on all 3 days; over parts of Jharkhand on day 2; over parts of J&K and Karnataka on day 2 and 3; over parts of north Bihar on day 3.

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

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

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

**> 25 dBZ Model Reflectivity:** Over parts of Andhra Pradesh, Orissa, parts of Sikkim, SHWB, Assam and adjoining areas on day1; over parts of Orissa, Bihar, Jharkhand, GWB, SHWB, Arunachal Pradesh, Assam and adjoining areas on day 2; over parts of East Uttar Pradesh, Uttarakhand, Orissa, Sikkim, Bihar, Jharkhand, SHWB, GWB and NE states on day 3; maximum value of the Model reflectivity is seen over parts of Sikkim, Assam, Arunachal Pradesh Bihar, Jharkhand, GWB, SHWB and adjoining areas on day 2 and 3, over some parts of East Uttar Pradesh on day 3.



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

**Total Total Index (> 50):** Above threshold value is observed over most parts of the country except extreme south peninsular India, southern parts of west coast, and coastal areas along the east coast during all 3 days; below threshold value is seen over parts of Sikkim adjoining Bihar and NE states from day 1 onwards and over some parts of Orissa and adjoining GWB on day 1; maximum value of the index is seen over parts of J&K, Himachal Pradesh, Punjab, Haryana, Delhi and adjoining areas, Uttar Pradesh, Rajasthan, Madhya Pradesh, Vidarbha, Chhattisgarh, Karnataka, Telangana, Gujarat, Madhya Maharashtra and Marathwada region on all 3 days,

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

**CAPE (> 1000):** Greater than threshold value over parts of Gujarat, coastal areas of southern part of west coast, coastal Maharashtra, Konkan and Goa, coastal areas along the east coast, coastal Orissa, GWB, Bihar, Jharkhand, parts of Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Chhattisgarh, Madhya Maharashtra, Marathwada, Vidarbha, Telangana, Rayalaseema, Extreme south peninsular India and NE states during all 3 days; over parts of Punjab and adjoining Haryana and Uttarakhand on day 1; over parts of Punjab Himachal Pradesh, adjoining Uttarakhand and West Uttar Pradesh on day 2; over parts of Punjab, Haryana, Delhi, Himachal Pradesh, adjoining Uttarakhand, Uttar Pradesh from day 2 onwards; Maximum value of the index is seen over the parts of North Interior Karnataka adjoining Konkan and Goa on day 1; over parts of Coastal Gujarat on day 2; over parts of Karnataka, Orissa, GWB and Jharkhand on day 3.

**CIN (50-150):** Over coastal areas of east coast and west coast, GWB, parts of Orissa, Madhya Pradesh, Vidarbha, Chhattisgarh, Rajasthan, J&K, Punjab, Haryana, Delhi, Himachal Pradesh, Uttarakhand, Uttar Pradesh, Bihar, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Coastal Maharashtra, Konkan and Goa, Telangana, Rayalaseema and NE states on all 3 days; over parts of West Madhya Pradesh and Vidarbha on day 2 and 3.

## 3. Rainfall and thunderstorm activity:

Above 130 mm Rainfall: over some parts of SHWB on day 3.

70- 130 mm rainfall: over parts of SHWB and Sikkim on day 2 and 3; Assam and adjoining Arunachal Pradesh on day 2, over places along Foothills of Himalaya on day 3.

40-70 mm Rainfall: over parts of Sikkim, Arunachal Pradesh, Assam and adjoining areas on day 2 and 3; over parts of Orissa and adjoining GWB on day 2; over parts of Bihar adjoining Jharkhand region, SHWB, places along Foothills of Himalaya, Manipur, Mizoram, Nagaland and adjoining areas on day 3.

10- 40 mm Rainfall: Over parts Tamil Nadu, Kerala, Andhra Pradesh, Orissa, Foothills of Himalaya, Arunachal Pradesh, Sikkim, Assam, Tripura, Mizoram, Nagaland, Manipur and adjoining areas during all 3 days; over parts of Bihar and Jharkhand on day 2 and 3; over some parts of Himachal Pradesh on day 2; over some parts of Uttarakhand, East and West Uttar Pradesh 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, Chhattisgarh, Bihar, Jharkhand, Orissa, GWB and NE states on all 3 days; over parts of Punjab, Haryana, Delhi, East Uttar Pradesh and North central Madhya Pradesh on day 3, over parts of East Madhya Pradesh on day 1; over parts of North- West Rajasthan on day 2 and 3.



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

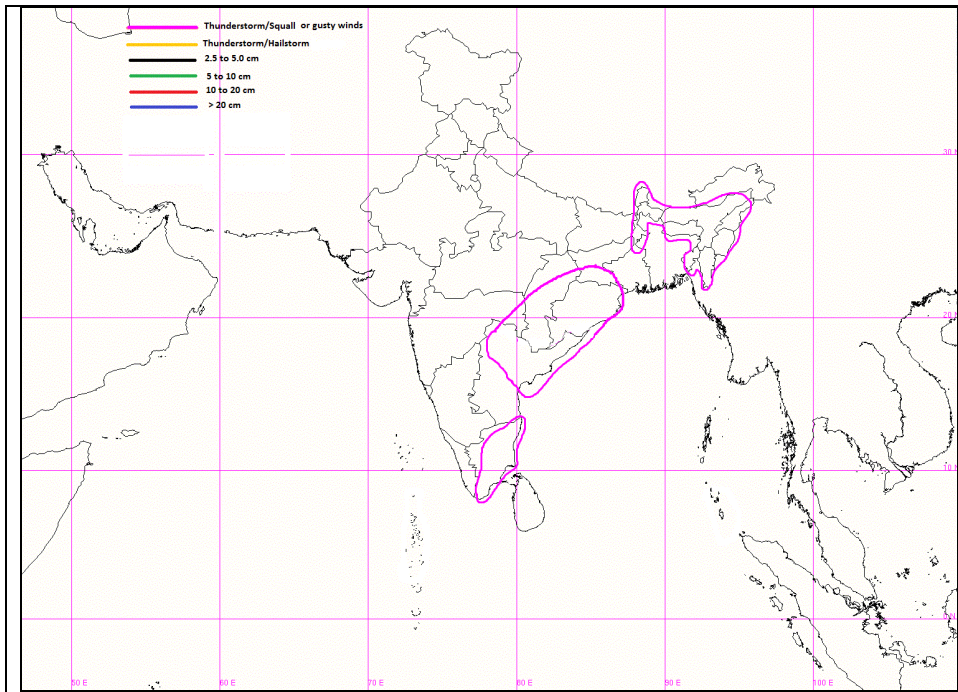
#### Summary and Conclusions:

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

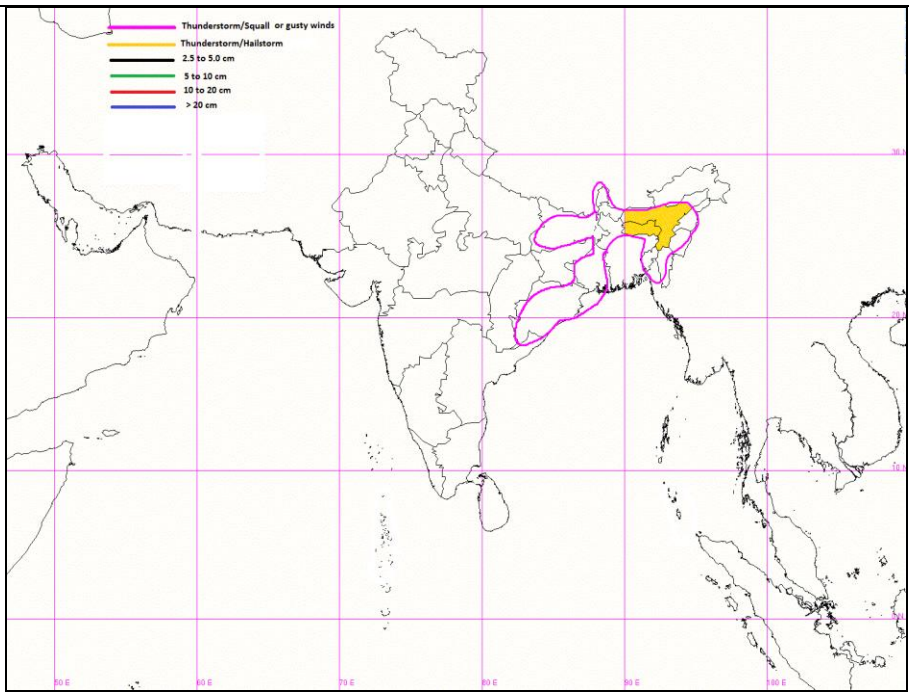
- Synoptic analysis, as well as model analysis of today, indicates that the north-south trough from west Madhya Pradesh to north Kerala coast has merged with another trough from North Interior Karnataka across northeast Rajasthan, West Madhya Pradesh, western parts of Vidarbha and Marathwada. Another trough in easterlies at 1.5 km above mean sea level runs from Comorin area to South Interior Karnataka across interior
- Tamilnadu. Considering these factors, Interior South Chhattisgarh, Tamilnadu, North coastal Andhra Pradesh, parts of Telangana may experience thunderstorm with gusty winds on Day-1.
- Due to the presence of the cyclonic circulation over northeast Jharkhand and adjoining Gangetic West Bengal, Odisha, the Sub Himalaya West Bengal and Assam, Meghalaya and NMMT may experience the thunderstorm with gusty winds on Day-1. However, these activities will continue on Day-2 including Orissa and Gangetic West Bengal.
- On Day-2, the IMD GFS deterministic models indicate an increase in rainfall activity from North Orissa, GWB, SHWB to Assam and Meghalaya. This may results in the thunderstorm with squall and hail is very likely at isolated places over Assam & Meghalaya.
- Most thermodynamic indices (CAPE, SWEAT, T-STORM Initiation Index, Lifted Index) indicate a high probability of thunderstorm occurrence along the south peninsular coast of India.

24 hour Advisory for IOP:	48 hour Advisory for IOP:
<b>Rainfall:</b> Nil  <b>Thunderstorm with associated phenomena:</b> Sikkim, Sub Himalayan West Bengal, South Jharkhand, Odisha, South Chhattisgarh Assam, Meghalaya, Nagaland, Manipur, Mizoram, Tripura Coastal Andhra Pradesh, Telangana, Tamil Nadu,	<b>Rainfall:</b> Nil  <b>Thunderstorm with associated phenomena:</b> Sikkim, Sub Himalayan West Bengal, Gangetic West Bengal Bihar, Odisha Assam, Meghalaya, Nagaland, Manipur, Mizoram, Tripura

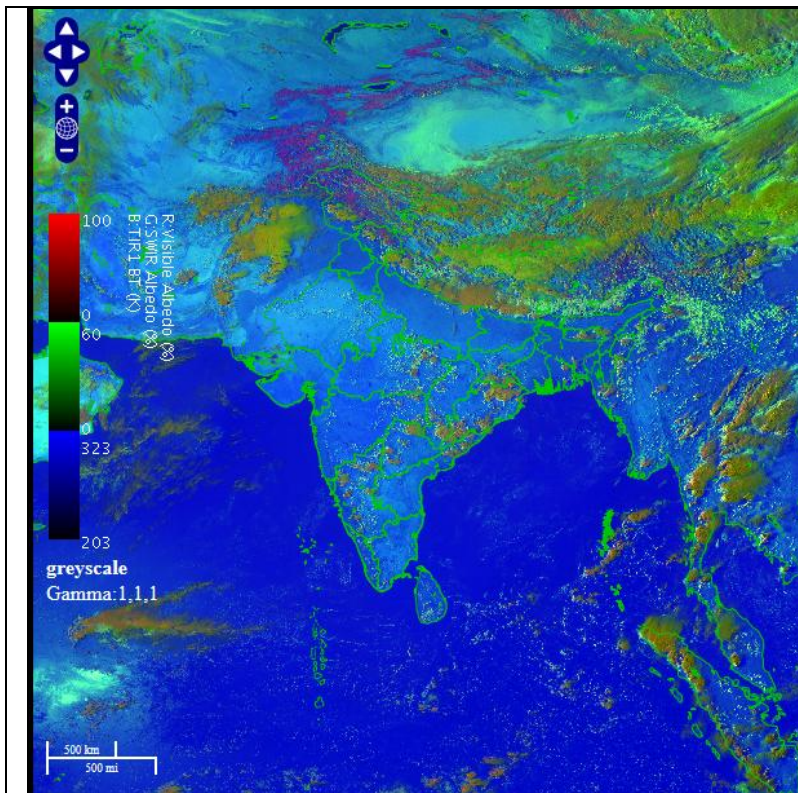
Graphical Presentation of Potential Areas for Severe Weather:



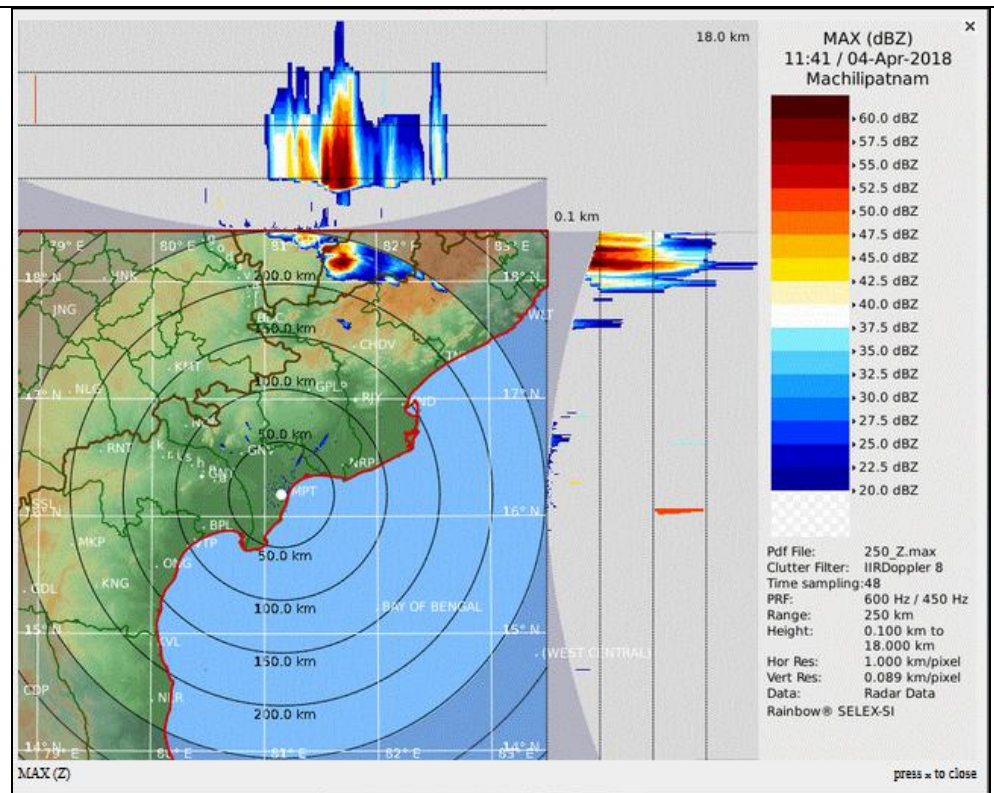
IOP Advisory for 24 hours



IOP Advisory for 48 hours

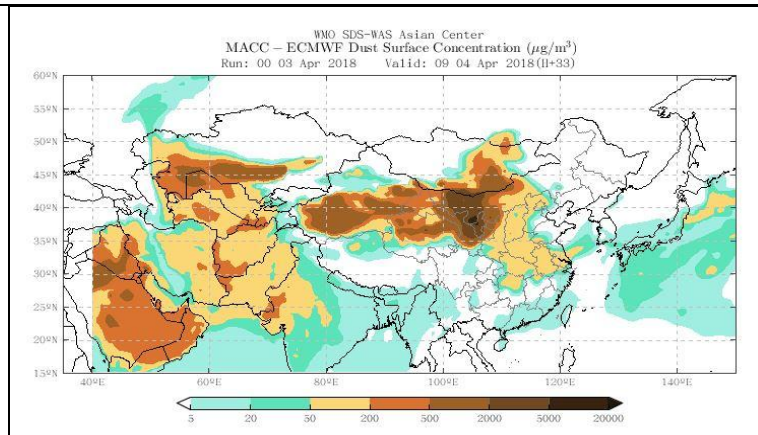


**RAPID RGB Imagery at 1530 IST of the Day**

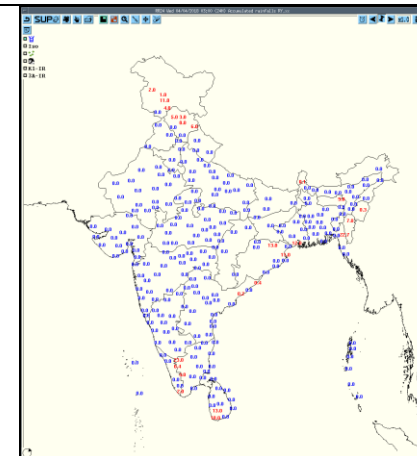


**DWR Machilipatnam at 1711 IST of the Day**

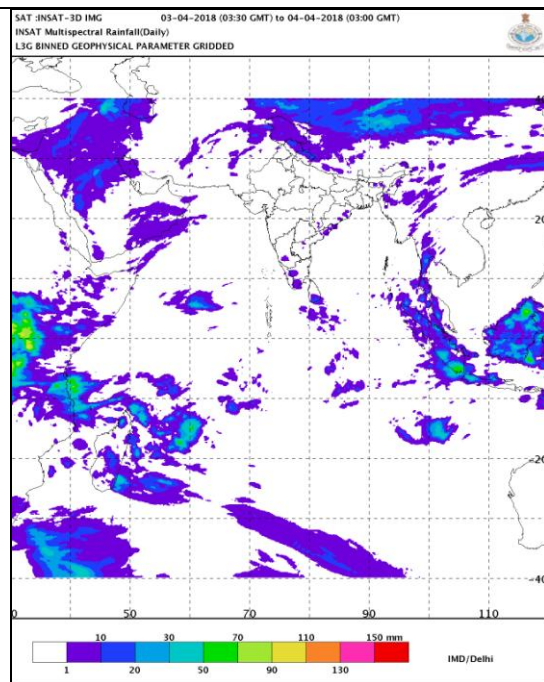




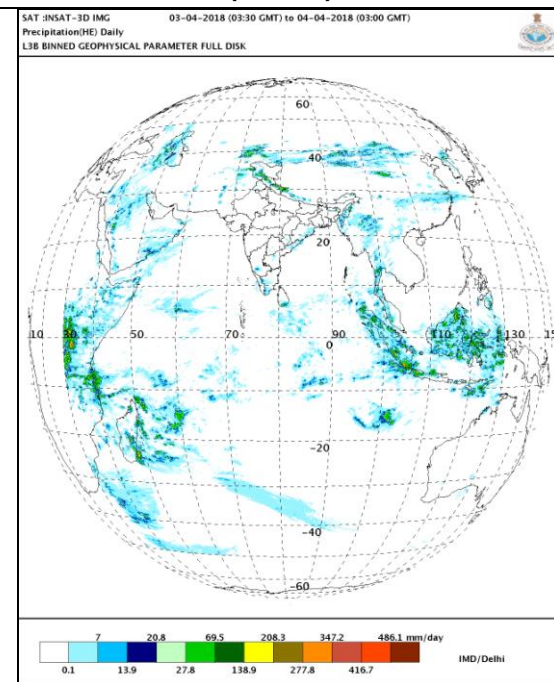
**Dust Forecast**



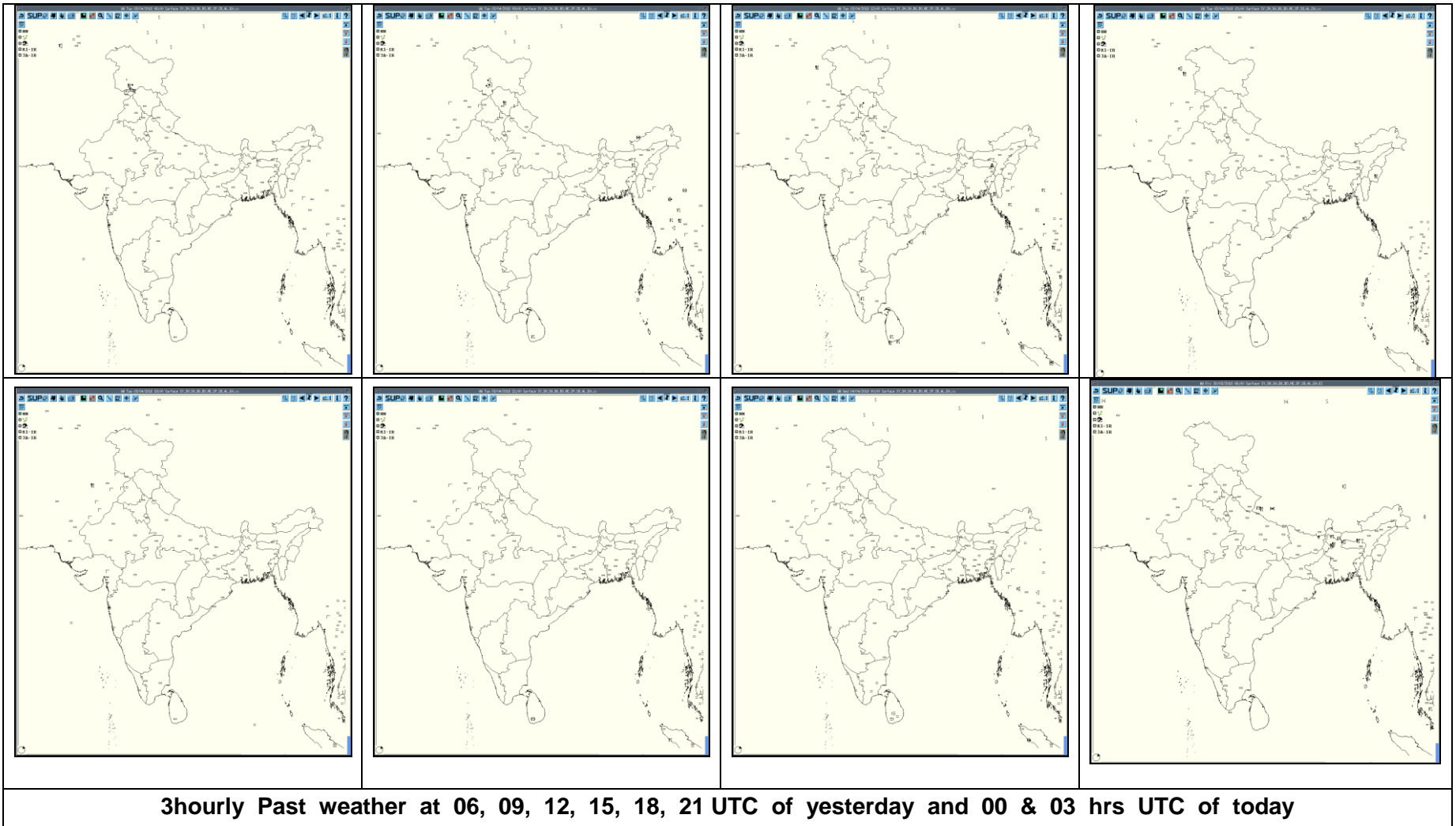
**Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today**

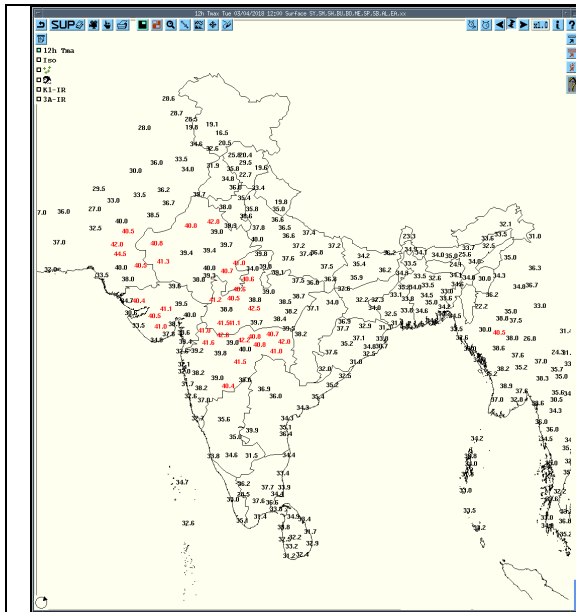


**IMR**

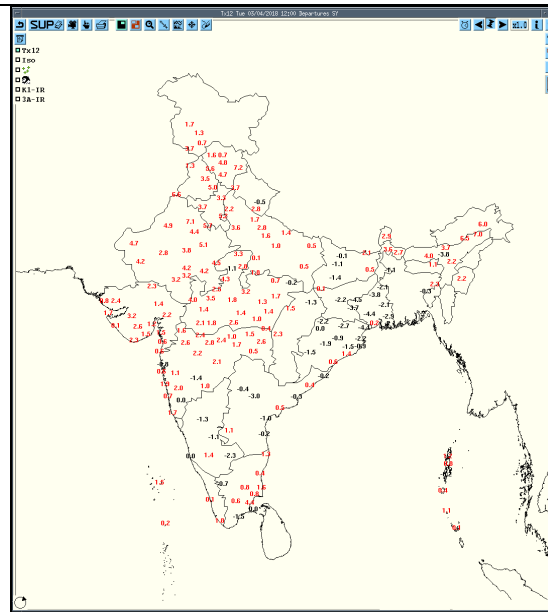


**HEM**

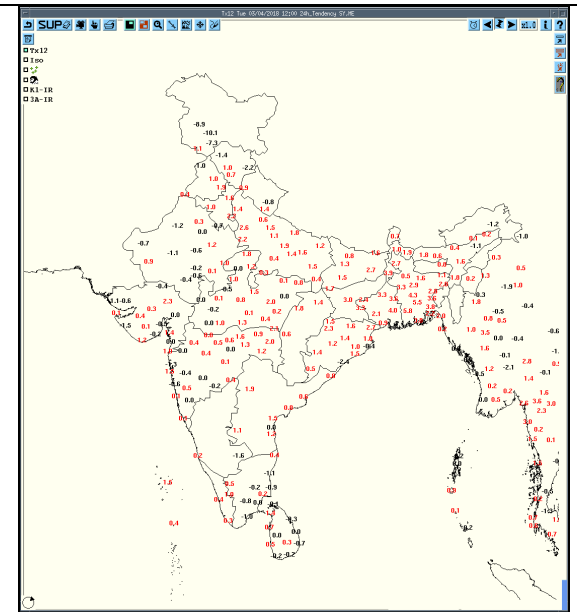




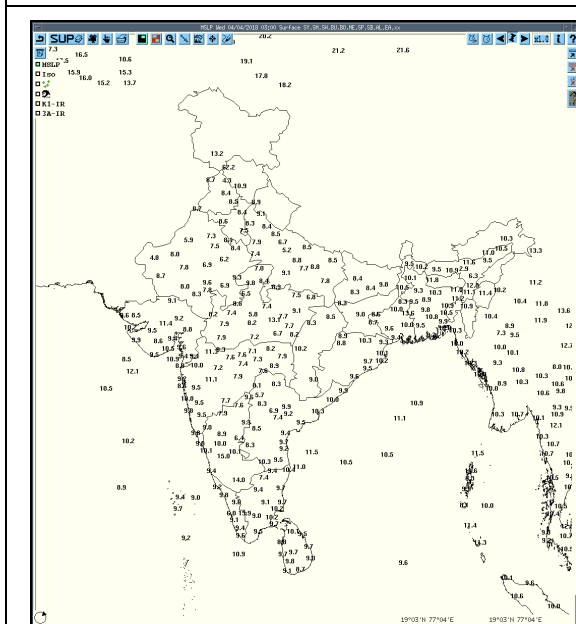
T<sub>max</sub>



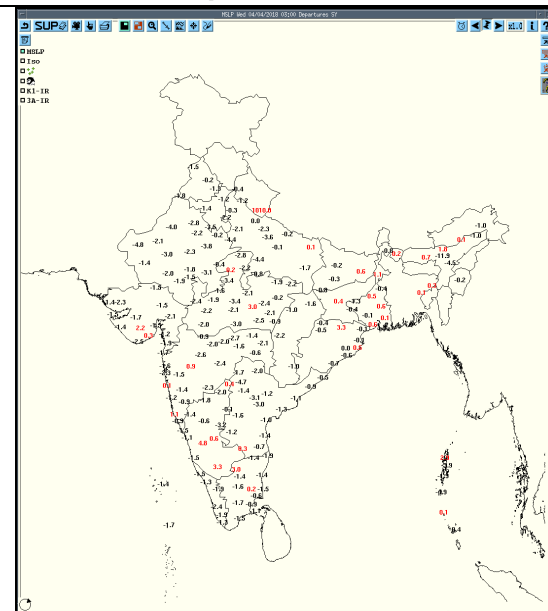
Departure T<sub>max</sub>



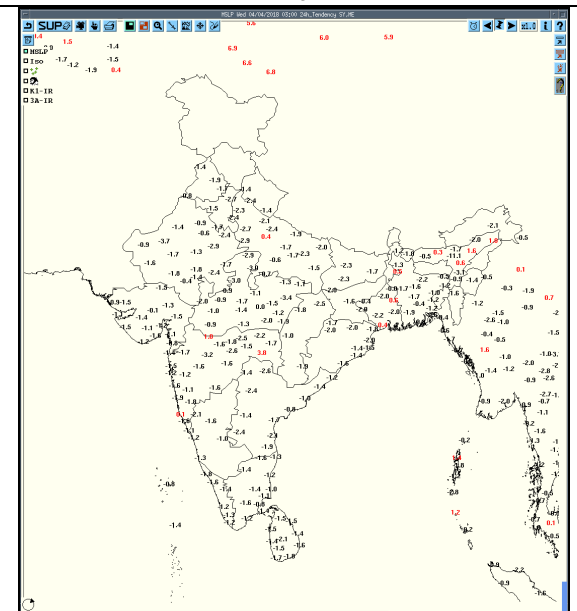
Tendency T<sub>max</sub>



MSLP

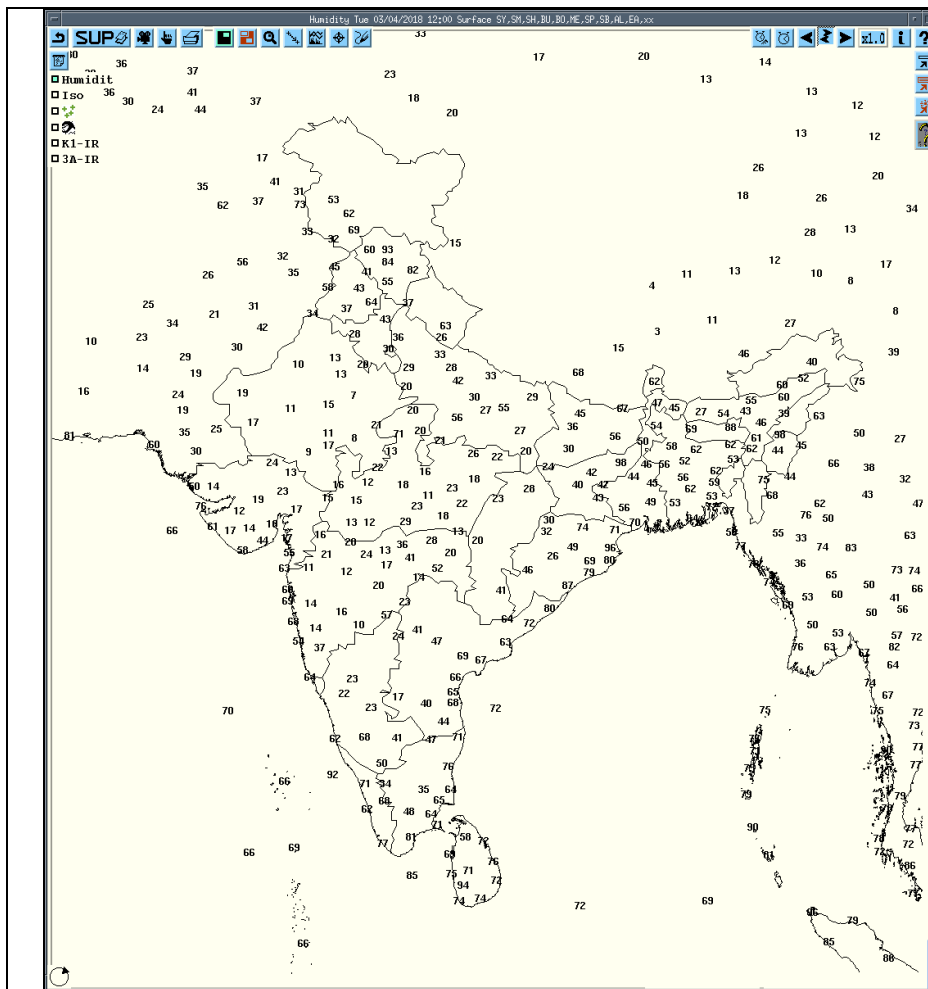


Departure MSLP

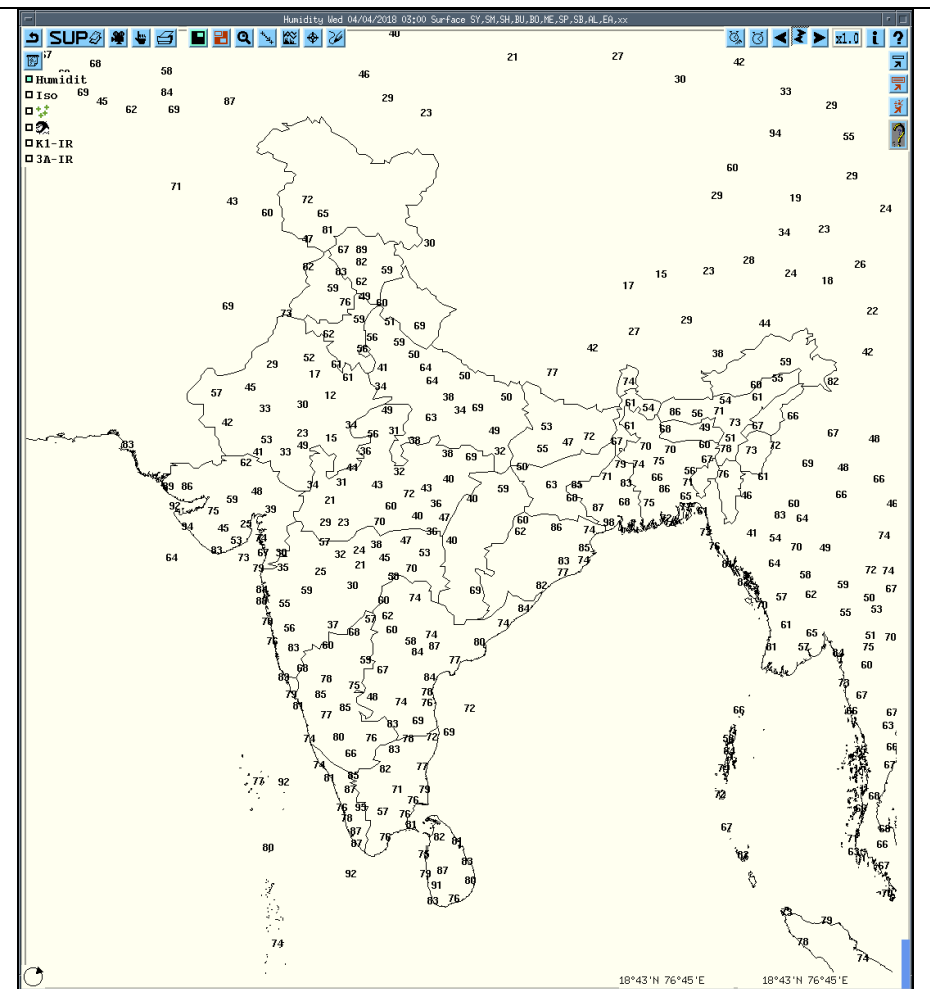


Tendency MSLP





**RH at 12UTC yesterday**



**RH at 03UTC today**

## Past 24 hours DWR Report:

DWR Station Name	Date of Report	Time Interval of Observation	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	Associa ted Severe Weathe r if any	Districts affected
Lucknow	04-04-18	030300-040300	Nil	Nil	Nil	Nil	Nil
Jaipur	04-04-18	030300-040300	Nil	Nil	Nil	Nil	Nil
Patna	04-04-18	030300-040300	Nil	Nil	Nil	Nil	Nil
Agartala	04-04-18	030300-040300	Multiple cells are found over Meghalaya hills at 030712Z and subsequently squall line at 030952Z OF 44DBZ and subsequently 55 DBZ, 12 KMS	180 Kms TO 200 kms NNW, 30 kmph W-ly.	Dissipated over Meghalaya hills at 031302Z	Not Known.	
			Multiple cells are found over hills of Mizoram at 030852Z and subsequently squall line at 031152Z OF 44DBZ and subsequently 55 DBZ, 12 KMS	200 Kms TO 230 kms SW, 30 kmph SW-ly.	031422Z, persists with dissipating stage over Ambasa & Lengpui	Not Known.	
Patiala	030300-040252	030300- 030600	No Echo	--	--	--	--
		030600-003900	Multiple echoes , dBz =49.0, ht.08-10 km	NE, N Sectors. Movement towards E Direction		RA/TS	B Dam, Bhunter, Kalpa
		030900-031200	Multiple echoes, dBz =54.5, ht 09-12 km	NE, N Sectors. Movement towards E Direction		RA/TS	Sundernagar , Kalpa, Uttarkashi, Shimla
		031200-031500	Multiple echoes, dBz =49.0, ht 09-11 km	N, E Sectors. Movement towards E Direction		RA/TS	Dharmshala, Sundernagar , Mussoorie
		031500-040252	NO ECHO	--	--	--	--
Visakhapatnam	04-04-18	030900	Multiple Cb cells from W TO NE with max reflectivity 65dbz in the NE with height 13kms.	194kms (NE) .Since 06:41UTC and moving S ly.	Two more Cb cells of max reflectivity 60 dbz in the NW	-	Puri in odissa.
		031200	Multiple strong Cb cells at W,NW and NE where the max reflectivity 67dbz and height	194kms (NE)Since last	-	-	PURI,SRIKA KULAM
		031500	Multiple strong Cb cells at SW,W and NE where the max reflectivity 59dbz and height 11kms in the SW .	127kms (SW) Since last observation and moving SE ly.	-	-	Ganjam (Odisha), Srikakulam and East
		031800	Isolated Cb cells at N and NE where the max reflectivity 54dbz and height 10kms	128 kms, Since last observation and moving SE ly.	Dissipating started from 1541 UTC	-	Koraput and Ganjam (Odisha)

DWR Station Name	Date of Report	Time Interval of Observation (UTC)	Organisation of cells (Isolated single cells/multiple cells/convective regions /squall lines) with height of 20 dBZ echo top and maximum reflectivity	Formation w.r.t. radar station and Direction of movement	Remarks	Associate d Severe Weather if any	Districts affected
Kolkata	04-04-18	030301-030721	NIL	NIL	NOSIG ECHO	NIL	NIL
		030601-030901	Isolated single cell with maximum height of 11.20 km 0831 UTC and maximum reflectivity of 62.0 dBz at 0831 UTC.	SW (233.9 km) moving in East-ward direction with a speed of 18.0 kmph	Isolated single cell developed at 0601 UTC in SW at distance of 233.9 km from Radar. Matured, dissipated at 0901 UTC, in SW at a distance of 190.4 km from Radar.	Thunderstorm/Rain	N/A
		031132-03331	Isolated single cell with maximum height of 11.73 km 1231 UTC and maximum reflectivity of 53.0 dBz at 1222 UTC.	SW (248.6 km) moving in SE-ward direction with a speed of 38.0 kmph	Isolated single cell developed from SW at 1132 UTC at distance of 248.7 km from Radar. Matured, dissipated at 1331 UTC, in SSW at a distance of 244.7 km from Radar.	Thunderstorm/Rain	N/A
		031332-040301	NIL	NIL	NOSIG ECHO	NIL	NIL

## 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)
Sundernagar	Northwest India	Himachal Pradesh	Thunderstorm	03-04-18	1654	1920
Tehri	Northwest India	Uttarakhand	Thunderstorm	03-04-18	1650	2010
Qazigund	Northwest India	Jammu & Kashmir	Thunderstorm	03-04-18	1100	1135
Kukernag	Northwest India	Jammu & Kashmir	Thunderstorm	03-04-18	1135	1145
Banihal	Northwest India	Jammu & Kashmir	Thunderstorm	03-04-18	1035	1200
Batote	Northwest India	Jammu & Kashmir	Thunderstorm	03-04-18	1025	1310
Katra	Northwest India	Jammu & Kashmir	Thunderstorm	03-04-18	1105	1145
Bhaderwah	Northwest India	Jammu & Kashmir	Thunderstorm	03-04-18	1030 1330	1200 1415
Tuni	South India	Andhra Pradesh (CAP)	Thunderstorm	03-04-18	1620	1700
Jagdalpur		Chhattisgarh			1530	1610
Barapani	Northeast India	Meghalaya(NMMT)	Thunderstorm	03-04-18	1420	1710
Cherrapunjee	Northeast India	Meghalaya(NMMT)	Thunderstorm	03-04-18	1235	1615
Shillong	Northeast India	Meghalaya(NMMT)	Thunderstorm	03-04-18	1330 1550	1515 1615
Imphal	Northeast India	Manipur(NMMT)	Thunderstorm	03-04-18	1915	2045
Lengpui	Northeast India	Mizoram(NMMT)	Thunderstorm	03-04-18	1830	2110
Digha	East India	West Bengal (GWB)	Thunderstorm	03-04-18	0740	0830
Kalingapatnam	South India	Andhra Pradesh (CAP)	Thunderstorm	03-04-18	1800	1940
Coimbatore	South India	Tamilnadu	Thunderstorm	03-04-18	1730	1830
Coonoor	South India	Tamilnadu	Thunderstorm	03-04-18	1530	1630
CIAL Kochi	South India	Kerala	Thunderstorm		1458	1538
Thiruvananthapuram	South India	Kerala	Thunderstorm		1629	1635
Thiruvananthapuram AP	South India	Kerala	Thunderstorm		1255 1322	1320 1350

## 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)

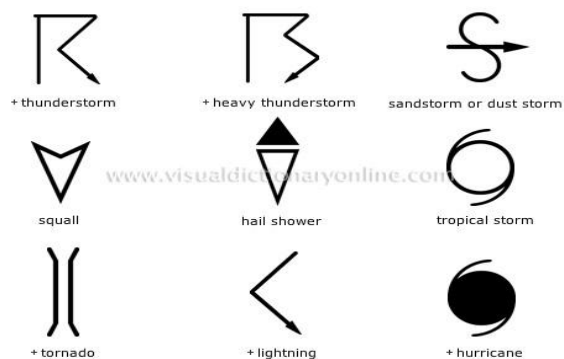
For Radar images of the past 24 hours including mosaic of images:

[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>	