

# **India Meteorological Department** FDP STORM Bulletin No. 40 (15-04-2018)

## 1. CURRENT SYNOPTIC SITUATION:

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

- The remnant Western Disturbance as a trough with its axis at 5.8 km above mean sea level now runs roughly along Long 95°E to the north of Lat 25°N.
- The Western Disturbance as an upper air cyclonic circulation at 3.1 km above mean sea level over northeast Afghanistan & neighborhood now lies over northeast Afghanistan and adjoining Pakistan.
- Another, Western Disturbance as a trough in mid and upper tropospheric westerlies with its axis at 7.6 km above mean sea level roughly along Long. 55°E to the north of Lat. 30°N persists.
- The cyclonic circulation over West Rajasthan & adjoining Pakistan now lies over West Rajasthan and neighbourhood and extends upto 1.5 km above mean sea level.
- ♦ A trough runs from the above cyclonic circulation to Coastal Karnataka across southwest Madhya Pradesh, Madhya Maharashtra and south Konkan and extends upto 1.5 km above mean sea level.
- The trough at 1.5 km above mean sea level from the cyclonic circulation over southwest Madhya Pradesh and neighbourhood to North Interior Karnataka across Madhya Maharashtra and Marathawada has merged with the above trough.
- ♦ A trough extends from north Bihar to Manipur across northern parts of Bangladesh and Meghalaya and extends upto 0.9 Km above mean sea level.
- The trough of low at mean sea level over Maldives- Lakshadweep area with the cyclonic circulation aloft extending upto 1.5 km above mean sea level persists.
- The trough of low at mean sea level over Equatorial Indian Ocean and adjoining southeast Bay of Bengal & neighbourhood with an embedded cyclonic circulation extending upto 3.1 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 were seen over Afghanistan adjoining Pakistan, Northwest Jammu & Kashmir & over area between Lat 37.0N to 49.0N Long 60.0E to 90.0E neighbourhood in association with another WD over the area.

#### **Convective Activity:**

Convective cell that are developed over South Kerala, Tamilnadu, North Interior Karnataka and moving E-wards direction.

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

Based on 0900 UTC satellite data indicate precipitation is likely to take place during next three (03 hrs) over Tamilnadu, Kerala, South Interior Karnataka, Lakshadweep and Bay Islands.

#### Clouds descriptions within India:

Scattered low/medium clouds seen over Jammu & Kashmir, south Punjab, Himachal Pradesh, North Uttarakhand, West Central Haryana and South Uttar Pradesh. Scattered low/medium clouds with embedded moderate to intense convection seen over West Arunachal Pradesh and weak to moderate convection North Chhattisgarh, Sikkim, rest Arunachal Pradesh, Central Assam adjoining Meghalaya, Nagaland, Manipur, extreme east Tamilnadu, South Interior Karnataka adjoining West Telangana, South Kerala, Lakshadweep, and Bay Islands. Isolated low/medium clouds with embedded over North Gujarat, East Madhya Pradesh, South Rajasthan, Maharashtra, Odisha and rest Northeast states. Scattered low/medium clouds with embedded weak to moderate convection seen over rest Telangana, south Coastal Karnataka, rest Kerala and rest South Tamilnadu.

#### Arabian Sea:-

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

#### Bay of Bengal & Andaman Sea:

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

#### Past Weather:

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

Moderate to Intense convection was observed over Chhattisgarh Odisha Bihar Jharkhand Gangetic West Bengal Sikkim North-East States East Madhya Pradesh Vidarbha Telangana Kerala Tamilnadu and Weak to Moderate convection observed over J&K Himachal Pradesh Uttarakhand Rajasthan East Uttar Pradesh Karnataka Andhra Pradesh.

#### OLR:-

Up-to 230 wm<sup>-2</sup> observed over Jammu & Kashmir Himachal Pradesh North Uttrakhand North-East States Kerala and Tamilnadu. Up-to 250 wm<sup>-2</sup> observed over Chhattisgarh Odisha South Jharkhand Gangetic West Bengal

#### Synoptic Features (Westerly Trough & Jet Stream):

Trough in westerlies runs roughly along long 56.0E & north of lat 30.0N

#### **Dynamic Features:-**

Up to 30- 60 Knots wind shear is observed over North & Central India and 10-20 over south peninsula India. Negative Shear tendency is observed over East Gujarat East Rajasthan Madhya Pradesh Chhattisgarh Odisha . A positive Vorticity field at 850 hPa is observed over Rajasthan Uttarakhand Uttar Pradesh west Madhya Pradesh Maharashtra. Negative Low Level Convergence is observed over J&K Himachal Pradesh Uttarakhand Tripura Coastal Andhra Pradesh.

## Precipitation:

#### IMR:

Rainfall upto 50-70 mm observed over Central Kerala South Tamilnadu.

Upto 30-50 mm observed over Gangetic West Bengal Tripura adjoining South Assam.

Upto 20-30 mm observed over Arunachal Pradesh South Coastal Odisha rest Kerala.

Upto 01-10 mm observed over Chhattisgarh rest Odisha South Jharkhand rest North-East States South-East Madhya Pradesh East Vidarbha North Coastal Andhra Pradesh South Interior Karnataka Central Tamilnadu.

## HEM:

Rainfall upto 28-70 mm observed over Central Kerala South Tamilnadu Arunachal Pradesh Manipur.

Rainfall upto 7-20 mm observed over Chhattisgarh Odisha adjoining North Coastal Andhra Pradesh Gangetic West Bengal rest North-East States rest Kerala

Rainfall upto 0.1-7 mm observed over South Jharkhand South-East Madhya Pradesh Telangana Karnataka North Tamilnadu.

#### RADAR and RAPID RGB Observation:

Isolated/multiple moderate echoes (dBZ >50 and height >10km) was seen on domain of DWR Nagpur and Hyderabad at around 1800 IST. Isolated/multiple light echoes were seen on DWR Agartala, Delhi and Jaipur at around 1730 IST.

RAPID RGB Satellite imagery at 1700IST indicates significant convection over extreme East Madhya Pradesh, North Chhattisgarh, Vidarbha, West Telangana, Interior Karnataka, Kerala and North Coastal Andhra Pradesh.

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 &	15.04.2018	16.04.2018
Forecast		
PM10 (micro-g/m <sup>3</sup> )	184	193
PM2.5 (micro-g/m <sup>3</sup> )	86	90

## 2. NWP MODEL GUIDANCE:

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

1. Weather Systems:

Low level CYCIRS, Troughs:

**00 UTC of Day 1-2:** 925 & 850 hPa Feeble trough over Bangladesh and adjoining NE India. **Day 3-5** A deep trough and associated strong winds over Bangladesh and adjoining NE region

12 UTC of Day 0: A weak CYCIR at 925 hPa over west Rajasthan and adjoining Pakistan

#### **Confluence & wind Discontinuity regions:**

12 UTC of Day 0-2: 925hPa N-S discontinuity over Southern Peninsular India and SW-NE over MP Chhattisgarh Odisha

#### Synoptic Systems:

12 UTC of Day 1-3: WD as a weak trough at 500 hPa over J & K. A fresh WD approaching J & K in 00 UTC of Day 5

**00UTC of Day 1-3:** 925 hPa anticyclone over Bay of Bengal & Arabian Sea. In Day 4-5 associated winds are stronger.

#### 2. Location of jet and jet core (>60kt) at 500hPa): 12UTC - Nil (>50kts) Day 3: East U.P, Bihar & NE states

#### 3. Convergence at 850 hPa:

#### Day/Index: Subdivisions with Lower Level Convergence > 15 x 10^-5 /s

Day 0: Rayalseema, SI Karnataka,

Day1: Jharkhand, Haryana, Chandigarh, Delhi, East MP, SI Karnataka,

Day2: Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, SI Karnataka,

Day3: Assam Meghalaya, NE NMMT, Gangetic WB, Madhya Maharashtra, Tamilnadu, Puducherry, NI Karnataka, SI Karnataka,

Day4: Assam Meghalaya, Uttarakhand, East MP, NI Karnataka, SI Karnataka,

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

#### Day/Index: Subdivisions with Lower Level Vortex > 15 x 10^-5 /s

Day0: Assam Meghalaya, Gangetic WB, Bihar, Uttarakhand, Himachal Pradesh, Tamilnadu, Puducherry,

Day1: Assam Meghalaya, Sub Himalayan WB, Gangetic WB, Bihar, West UP, Haryana, Chandigarh, Delhi, Punjab,

Day2: Assam Meghalaya, NE NMMT, Jharkhand, Bihar, Uttarakhand, Punjab, Himachal Pradesh,

Day3: Assam Meghalaya, Sub Himalayan WB, Gangetic WB, Bihar, East UP, Uttarakhand, Himachal Pradesh, Tamilnadu, Puducherry,

Day4: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Jharkhand, Bihar, Uttarakhand, Himachal Pradesh, 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, Uttarakhand, Odisha, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalseema, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka,

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

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Jharkhand, Bihar, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Konkan Goa, Madhya Maharashtra, Coastal Karnataka, NI Karnataka, SI Karnataka,

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

Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East MP, Chhattisgarh,

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Konkan Goa, Chhattisgarh, Coastal Karnataka, NI Karnataka,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Coastal AP, Telangana, Tamilnadu, Puducherry, SI Karnataka,

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

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

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

Day1: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, East MP, Konkan Goa, Madhya Maharashtra, Marathawada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalseema, Tamilnadu, Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

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

Day2: Assam Meghalaya, Sub Himalayan WB, Himachal Pradesh, Jammu Kashmir, Kerala,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Jammu Kashmir,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, 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) lies over south Pakistan & adjoining southwest Rajasthan persists. The analysis shows another cyclonic circulation over southwest Madhya Pradesh and adjoining areas in lower troposphere has become less marked. The analysis shows a trough extends from Sikkim to north Orissa across east Bihar and Jharkhand has become less marked. The forecast shows a cyclonic circulation over East Bihar and adjoining Jharkhand and GWB on day1. The analysis shows a north- south

Trough runs from south interior Karnataka to south Kerala. The forecast shows it will persist till day2. Another trough is seen in the analysis extending from south west Madhya Pradesh and adjoining areas to North Interior Karnataka across Madhya Maharashtra and Marathwada region. 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):** Low level Positive Vorticity is seen mostly along the foothills of Himalaya from J&K, Himachal Pradesh, Uttarakhand up to NE states also seen along the cyclonic circulation over southwest Madhya Pradesh and along the north- south trough for next 3 days. It is inferred that some parts of West Rajasthan and adjoining areas has Positive Vorticity on day 1 and 2.

# 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, Andhra Pradesh, Telangana, Rayalaseema, Kerala, Karnataka, Tamil Nadu, parts of Gujarat, Rajasthan, 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 East Madhya Pradesh on day 1 and 2; over some parts of East Uttar Pradesh on day 3; Maximum value of the index is seen over parts of Gujarat, GWB, Orissa, Andhra Pradesh, coastal Maharashtra, Tripura and adjoining areas on day 1 and 2; over parts of coastal Maharashtra, including Mumbai, Konkan and Goa, Karnataka, northern parts of Kerala, GWB, Orissa, Chhattisgarh, Telangana, Andhra Pradesh, Bihar, Jharkhand and SHWB on day 3.

**Lifted Index (< -2):** The threshold value of the index is below -2 over parts of Gujarat, coastal Andhra Pradesh, coastal Karnataka, Telangana, Rayalaseema, Konkan and Goa, Kerala, Tamil Nadu, southern part of west coast, coastal areas along the east coast, Chhattisgarh, East Madhya Pradesh, East Vidarbha, Orissa, GWB, SHWB, Sikkim and NE states on all 3 days; over parts of Bihar and Jharkhand on day 2 and 3; maximum negative value of the index less than -8 is seen over parts of GWB and coastal Orissa on day 1; over parts GWB, coastal Orissa, coastal Andhra Pradesh, Tripura and adjoining areas on day 2 and 3; the value of the index less than -10 is seen over parts of GWB on day 3

**Total Total Index (> 50):** The threshold value of the index is **> 50** over some parts of Rajasthan, Gujarat, Himachal Pradesh, Uttarakhand, Uttar Pradesh, Madhya Pradesh, northern parts of Madhya Maharashtra, Bihar and Jharkhand on day 1; over parts of Gujarat, Himachal Pradesh, Uttarakhand, Punjab, Haryana, Delhi, Foothills of Himalaya, Uttar Pradesh, Rajasthan, Madhya Pradesh, Bihar, Jharkhand, Madhya Maharashtra, GWB and SHWB on day 2; over parts of Gujarat, Uttarakhand, Punjab, Haryana, Delhi, Uttar Pradesh, Bihar, Jharkhand and Vidarbha on day 3; maximum value of the index >60 is seen over parts of East Uttar Pradesh and Bihar On day 1; over parts of Rajasthan, Uttarakhand, Uttar Pradesh and north west Madhya Pradesh on day 3.

**Sweat Index (> 300):** Although the threshold value of the Index >300 is seen in most parts of the country except Northern parts of Rajasthan, Punjab, Haryana Delhi and west Uttar Pradesh during next 3 days but the maximum value of the index greater than 800 is seen over parts of GWB and adjoining areas on day 1 and day 2; over parts of GWB adjoining Orissa, SHWB, Jharkhand, Tripura and adjoining areas on day 3.

**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, coastal Karnataka, Gujarat, coastal Maharashtra, Konkan and Goa, Jharkhand, GWB, SHWB, Sikkim, Assam, Meghalaya, Tripura and adjoining areas during all 3 days; over parts of Bihar and adjoining areas on day 2 and 3; Maximum value of the index greater than 2500 is seen mostly over parts of GWB, coastal Orissa and Coastal Andhra Pradesh on day1 and 2; over parts of GWB, coastal Orissa and coastal Andhra Pradesh, coastal Tamil Nadu and costal Karnataka 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, Punjab, Himachal Pradesh, Uttarakhand, Haryana, Delhi and extreme Northern parts of Rajasthan during all 3 days, the maximum value of the index > 200 is seen

over parts of Gujarat, costal Maharashtra, Madhya Pradesh, Chhattisgarh, GWB, Orissa, Karnataka and NE states on day1; over parts of Bihar, Jharkhand, Sikkim, NE states, SHWB, GWB, Andhra Pradesh, Karnataka, Gujarat, coastal Maharashtra, Konkan and Goa, Vidharbha, Madhya Pradesh, Chhattisgarh, Telangana. Bihar, Jharkhand, Uttar Pradesh, Rajasthan on day 2 and 3; the maximum value of the index > 400 is seen over parts of Bihar, Jharkhand, SHWB, Sikkim, Assam and adjoining areas on day 2; over parts of Bihar, Jharkhand, SHWB, Tripura and adjoining areas on day 3.

#### 5. Rainfall Activity:

40-70 mm Rainfall: over parts of Jammu and Kashmir on day 2 and parts of Tripura on Day 3.

10-40 mm Rainfall: over parts Kerala, Tamil Nadu, Karnataka, Jammu and Kashmir and NE states during next 3 days; over parts of Orissa and adjoining Andhra Pradesh on day 1; over parts of east Madhya Pradesh, adjoining Chhattisgarh and Vidharbha on day 2; over parts of J&K on day 3.

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

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

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

> 25 dBZ Model Reflectivity: Over parts of NE states, East Uttar Pradesh, Orissa, Andhra Pradesh, Kerala, Tamil Nadu, Karnataka, Chhattisgarh adjoining Vidarbha and east Madhya Pradesh on day 1; over parts of J&K, Rajasthan, Haryana, Northwest Madhya Pradesh, Chhattisgarh adjoining Orissa, Assam, Arunachal Pradesh, Mizoram, Nagaland, Tripura and adjoining areas on day 2; over parts of J&K, Himachal Pradesh, Uttarakhand, Punjab, Haryana and adjoining areas, Northwest Rajasthan, Orissa, Chhattisgarh, Andhra Pradesh, East Madhya Pradesh, Sikkim, Arunachal Pradesh, Assam and adjoining areas on day 3; maximum value of the Model reflectivity is seen over parts of Jammu and Kashmir states on day 1,2 and 3.

#### 2. Spatial distribution of 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 south peninsular India, southern parts of west coast and the east coast, southern parts of Chhattisgarh, orissa, coastal Andhra Pradesh, Karnataka, Telangana, Rayalaseema, south coastal Maharashtra, Konkan and Goa, Sikkim and NE states during all 3 days; below threshold value is seen over some parts of Vidharbha, south Madhya Maharashtra, Marathwada and some parts of south east Madhya Pradesh on day 1; over parts of south Madhya Maharashtra and Marathwada on day 2 and 3; maximum value of the index is seen over parts of Haryana, Delhi, Rajasthan, Gujarat, Madhya Pradesh, Chhattisgarh, Jharkhand, Vidharbha, east and west Uttar Pradesh during all 3 days; over and some parts of GWB on day 1; over parts of J&K, Punjab, Himachal Pradesh and Uttarakhand on day 2; over parts of Bihar, GWB, Madhya Maharashtra and Marathwada 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, 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 Bihar on day 2; 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 and GWB on day 1 and 2; over parts of coastal Maharashtra, GWB, coastal Orissa, Karnataka and coastal Kerala 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, Punjab, Himachal Pradesh, Rajasthan, Haryana, Delhi, Uttarakhand, west Uttar Pradesh on day 1; the maximum value of the index > 400 is seen over Gujarat, Madhya Pradesh, Bihar, Jharkhand and Orissa on day 1; over parts of Punjab, Rajasthan, Uttar Pradesh, Gujarat, northern parts of coastal Maharashtra, Madhya Pradesh, Bihar, Jharkhand, GWB and Orissa on day 2 and 3; over parts of Vidarbha and Telangana on day 3.

#### 3. Rainfall and thunderstorm activity:

40-70 mm Rainfall: over parts of Kerala on day 1, some parts of J&K on day 2 and day 3.

10- 40 mm Rainfall: over parts of Sikkim, NE states, Kerala, Karnataka, Tamil Nadu and adjoining areas during all 3 days, over parts of Orissa, Andhra Pradesh, south interior Karnataka and Telangana on day 1; over parts of J&K on day 1, day 2 and day 3

Up to10 mm Rainfall: Over parts of J&K, Himachal Pradesh, foothills of Himalaya, Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Telangana, Rayalaseema, Vidarbha, Madhya Maharashtra, Marathwada, Madhya Pradesh, Chhattisgarh, Orissa, GWB, Sikkim and NE states during next 3 days; over parts of west Uttar Pradesh on day1; over parts of Punjab, Haryana, Delhi, Uttar Pradesh, Rajasthan and some parts of Bihar on day 3.

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

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

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

- Synoptic analysis indicates that the cyclonic circulation over West Rajasthan and neighbourhood and a trough runs from the above cyclonic circulation to Coastal Karnataka across southwest Madhya Pradesh, Madhya Maharashtra and south Konkan, the entire central India including Rajasthan, Kerala, Tamilnadu to North Interior Karnataka across South Interior Karnataka will experienced thunderstorm with gusty winds activity on Day-1. Kerala may experience the heavy rainfall activity on Day-1.
- Another trough extends from north Bihar to Manipur across northern parts of Bangladesh and Meghalaya; this will trigger the thunderstorm with gusty winds activity over Assam, Meghalaya and NMMT on Day-1. This activity may continue to Day-2 over the same region.
- The Western Disturbance as an upper air cyclonic circulation lies over northeast Afghanistan and adjoining Pakistan. This system will give thunderstorm with gusty winds activity over J&K, Himachal Pradesh, Punjab and Northern India on Day-2.

24 hour Advisory for IOP:	48 hour Advisory for IOP:
Significant Rainfall:	Significant Rainfall:
South Kerala,	Nil
Thunderstorm with Squall/Gusty winds: Assam, Meghalaya, Nagaland, Manipur, Mizoram & Tripura Sub-Himalayan West Bengal & Sikkim, Gangetic West Bengal, Odisha, Rajasthan, Madhya Pradesh, Vidarbha, Chhattisgarh Kerala, Tamil Nadu, Interior Karnataka, Telangana, Coastal Andhra Pradesh, Kerala, Tamilnadu Thunderstorm with Hailstorm:	Thunderstorm with Squall/Gusty winds: Assam, Meghalaya, Nagaland, Manipur, Mizoram & Tripura Sub-Himalayan West Bengal & Sikkim, Odisha Interior Karnataka, Telangana Jammu & Kashmir, Himachal Pradesh, Punjab, Haryana, Delhi, Uttarakhand
Nil	Nil

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













# Past 24 hours DWR Report:

Radar Station name	Date	Time interval of observa tion (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	Associ ated severe weathe r if any	Districts affected
Visakhapatnam	14/04/18	0900UT C	Multiple cb cells with maximum reflectivity of 60 dbz with maximum height of 12 kms	WNW (106 KMS) moving SE ly	Cb cells started developing at 0741 UTC matured at 0801 UTC	NIL	East godavari
	14/04/18	1200UT C	Multiple cb cells with maximum reflectivity of 66dbz with maximum height of 15 KMS	NNE (178 KMS) NE(161 kms) moving SE ly	Since last observation cb cells developing matured at 1051 UTC	NIL	Srikakulam ganjam gajapati districts of orissa
	14/04/18	1500UT C	Multiple and Isolated CB cells with maximum reflectivity of 64dbz with maximum height of 15 KMS	N &NE (130-250 KMS) NW(106-230 kms) SW(50- 190KMS) moving ESE ly	Since last observation cb cells developing, matured well at 1321UTC. Dissipating at 1341 UTC and again developing.	-	Srikakulam, Visakhapatnam, East Godavari dist. (AP) Ganjam,Gajapati, Rayaguda, Kalahandi, Koraput, Nabarangapur districts of orissa
	14/04/18	1800UT C	Multiple CB cells with maximum reflectivity of 63dbz with maximum height of 14 KMS	NE(118- 162 KMS) &NW (110-215 KMS) N(137-200 kms) moving ESE ly	Since last observation cb cells developing and dissipating . Max. reflectivity of 63dBz observed at 1611UTC. Dissipating from 1651UTC onwards.	-	Srikakulam dist. (AP) Bastar dist. (Chatisgarh), Gajapati, Rayaguda, Koraput, dist. (Orissa)
	15/04/18	0000UT C	Multiple CB cells with maximum reflectivity of 55dBZ with maximum height of 10 KMS	NE(100 KMS) & NW (95-203 KMS) moving SE ly	Since last observation cb cells are dissipating . Max. reflectivity of 55dBz observed at 1901UTC.	-	Srikakulam, vizianagaram, Visakhapatnam dist. (AP), Gajapati, Ganjam Rayaguda, Koraput, dist. (Orissa)
	15/04/18	0300UT C	Isolated convective cells with maximum reflectivity of 27dBZ with maximum height of 5 KMS	ENE(123 KMS) moving S ly	Isolated convective cells formed at 0001 UTC DISSIPATED AT 0151 UTC	NIL	NIL

DWR Station	Date	Time interval of observat ion	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	Associated severe weather, if any	Districts affected
Lucknow	15-04-18	140300- 150300	Nil				
Patiala	15-04-18	140300- 150300	Nil				
Patna	15-04-18	140300- 150300	Nil				
Jaipur	15/04/18	140300- 150300	Multiple cell with average height of 5.5 km & maximum reflectivity 43.0 dBZ	Multiple cell develop from 0412 UTC of 14/04/2018 towards NW, W, SW, S, SE of Jaipur and moved to E, SE, Wards at speed 15-20 km/hr.	Multiple cell develop from 0712 UTC of 14/04/2018 towards NW,W, SW,S,SE of Jaipur and reaches maximum reflectivity during 1312 UTC to 1642 UTC of 14/04/18 and continue.	Thunderstor m,dusttrom with Light rain at a Isolated places	Nagaur, Pali, Ajmer, Tonk, Jaipur, Dausa Bundi,Kota, Baran, Jhalawar, Rajsamand,Sawai Madhopur Districts

Districts affected
NIL N/A
N/A
N/A
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)		
Kannur	South India	Kerala	Thunderstorm	15-04-18	0500	0545		
Karipur A P	South India	Kerala	Thunderstorm	14-04-18	2320	0050		
Belgaum AP	South India	North Interior Karnataka	Thunderstorm	14-04-18	1635	1720		
Gadag	South India	North Interior Karnataka	Thunderstorm	14-04-18	1720	1750		
Kanyakumari	South India	South Tamilnadu	Thunderstorm	15-04-18	0445	0800		

Realised TS/HS/SQ during past 24 hours ending at 0300UTC of today(received from RMCs/MCs)								
Name of Station	Region	State/Sub Division	Weather Event	Date	Time of	Time of end		
Reporting			(TS/Hail/Squall)		Commencement (IST)	(IST)		
Ajmer	Northwest India	East Rajasthan	Thunderstorm	14-04-18	2230	2330		
Bundi	Northwest India	West Rajasthan	Thunderstorm	14-04-18	2100	2130		
Nagpur	Central India	Maharashtra (Vidarbha)	Thunderstorm	14-04-18	1808	2230		
Yeotmal	Central India	Maharashtra (Vidarbha)	Thunderstorm	14-04-18	1930	2030		
Gondia	Central India	Maharashtra (Vidarbha)	Thunderstorm	14-04-18	1620	2230		
Ambikapur	Central India	Chhattisgarh	Thunderstorm	14-04-18	13.50	1510		
					1710	1825		
Jagdalpur	Central India	Chhattisgarh	Thunderstorm	14-04-18	1814	0210		
Pendra Road	Central India	Chhattisgarh	Thunderstorm	14-04-18	1300	1800		
Bilaspur	Central India	Chhattisgarh	Thunderstorm	14-04-18	1700	1905		
Mana (Raipur)	Central India	Chhattisgarh	Thunderstorm	14-04-18	1540	2020		
Mana (Raipur)	Central India	Chhattisgarh	Hail (Diameter 0.5mm)	14-04-18	1618	1620		
Passighat	Northeast India	Arunachal Pradesh	Thunderstorm	14-04-18	1920	2330		
Itanagar	Northeast India	Arunachal Pradesh	Thunderstorm	15-04-18	0540	/0550		
Jorhat	Northeast India	Assam	Thunderstorm	14-04-18	0710	0727		
Silchar	Northeast India	Assam	Thunderstorm	14-04-18	0830	0900		
Dibrugarh	Northeast India	Assam	Thunderstorm	14-04-18	1850	2330		
N/Lakhimpur	Northeast India	Assam	Thunderstorm	14-04-18	1610	1650		
					1900	1935		
					2240	2320		
N/Lakhimpur	Northeast India	Assam	Thunderstorm	15-04-18	0125	0220		
					0600	0620		
Guwahati	Northeast India	Assam	Thunderstorm	14-04-18	0830	0910,		
					1950	2020		
Guwahati	Northeast India	Assam	Hail	14-04-18	1945	1947		
Cherrapunjee	Northeast India	Meghalaya	Thunderstorm	14-04-18	0631	1340		
Imphal	Northeast India	Manipur	Thunderstorm	14-04-18	0850	1028		
Agartala	Northeast India	Tripura	Thunderstorm	14-04-18	1445	2120		
Gangtok	East India	Sikkim	Thunderstorm	14-04-18	1700	1830		
Tadong	East India	Sikkim	Thunderstorm	14-04-18	1650	1740		
Alipore	East India	Gangetic West Bengal	Thunderstorm	14-04-18	2002	2125		
DumDum	East India	Gangetic West Bengal	Thunderstorm	14-04-18	2013	2139		
Haldia		Gangetic West Bengal	Thunderstorm	14-04-18	2010	2105		
Digha	East India	Gangetic West Bengal	Thunderstorm	14-04-18	1700	1840		
					1935	2125		
Digha	East India	Gangetic West Bengal	Squall(Dir-NW, max. speed 44Kmph	14-04-18	2000	2002		
Bankura	East India	Gangetic West Bengal	Thunderstorm	14-04-18	1615	1635		
Bhubaneswar	East India	Odisha	Thunderstorm	14-04-18	1455	1720		
Balasore	East India	Odisha	Thunderstorm	14-04-18	1640	2100		
Chandbali	East India	Odisha	Thunderstorm	14-04-18	1810	2040		
Puri	East India	Odisha	Thunderstorm	14-04-18	1650	1830		
Gopalpur	East India	Odisha	Thunderstorm	14-04-18	1640	1745		

#### **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) 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/ Low Level Winds 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 Past24hourHEMandIMRrainfall(upto03UTCoftoday) IMR: http://satellite.imd.gov.in/img/3Ddaily\_imr.jpg HEM: http://satellite.imd.gov.in/img/3Ddaily he.jpg ForRadarimagesofthepast24hoursincludingmosaicofimages: http://ddgmui.imd.gov.in/dwr img/ Satellite sounder based T- Phigram http://satellite.imd.gov.in/mAndhra Pradesh skm2.html

# WEATHER SYMBOLS:



