



India Meteorological Department

FDP STORM Bulletin No. 46 (21-04-2018)

1. CURRENT SYNOPTIC SITUATION:

NWFC INFERENCE (0300UTC of the Day):

- ◆ The Western Disturbance as an upper air cyclonic circulation over north Pakistan & neighbourhood now lies over Jammu & Kashmir and neighbourhood at 3.1 km above mean sea level. The trough aloft in mid and upper tropospheric levels with its axis at 5.8 Km above mean sea level now runs roughly along longitude 73°E to the north of latitude 32°N.
- ◆ A fresh Western Disturbance is very likely to affect Western Himalayan region from 25th April.
- ◆ A cyclonic circulation extending upto 1.5 km above mean sea level lies over West Uttar Pradesh and adjoining Haryana.
- ◆ A north-south trough runs from East Uttar Pradesh to eastern parts of Vidarbha across East Madhya Pradesh at 0.9 km above mean sea level.
- ◆ The cyclonic circulation over Sub-Himalayan West Bengal and adjoining west Assam now lies over Sub-Himalayan West Bengal & neighbourhood and extends upto 0.9 km above mean level.
- ◆ The east-west trough at 0.9 km above mean sea level now runs from Jharkhand to east Assam across the above cyclonic circulation.
- ◆ The north-south wind discontinuity at 0.9 km above mean sea level from southeast Madhya Pradesh to south Tamilnadu now runs from North Interior Karnataka to south Tamilnadu across South Interior Karnataka & Kerala.

SATELLITE OBSERVATIONS during past 24 hrs and current observation:

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

Western Disturbance (WD):

Scattered multi-layered clouds seen over Caspian Sea and neighbourhood in association with Western Disturbance over the area.

Convective Activity:-

Convective Cells developed over Northeast Bangladesh, adjoining Meghalaya, **(Minimum CTT Minus 80 Deg C)**.

Precipitation Nowcast Based On WMO Scope Product:

Based on 0300 UTC satellite data indicate precipitation is likely to take place during next three (03 hrs) over Meghalaya.

Clouds descriptions within India:

Broken low/medium clouds with embedded moderate to intense convection seen over Meghalaya, & adjoining Bangladesh. Scattered low/medium clouds with embedded isolated weak convection seen over Arunachal Pradesh, Assam, Nagaland and Manipur. Scattered low/medium clouds seen

over Jammu & Kashmir, North Himachal Pradesh, Uttarakhand, South Interior Karnataka, North Kerala, adjoining Tamilnadu and Lakshadweep. Isolated low/medium clouds seen over rest parts of east India except Jharkhand & North Chhattisgarh. No significant clouds over West India.

Arabian Sea:-

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

Bay of Bengal & Andaman Sea:

No significant clouds seen over the region.

Past Weather:

Convection (during last 24 hrs):

Moderate to Intense convection was observed over North Kerala South Interior Karnataka North Coastal Andhra adjoining Orissa Meghalaya adjoining Bangladesh

OLR:-

Up-to 230wm^{-2} observed over Jammu & Kashmir Himachal Pradesh North Uttarakhand Sikkim Arunachal Pradesh Nagaland Manipur South Interior Karnataka

Synoptic Features:

Westerly Trough:

Trough in Westerlies roughly along Longitude 70.0E & north of Latitude 28.0N

Dynamic Features:

Up to 30- 80 kts **wind shear** is observed over North & Central India and 10-15 kts over south peninsula India.

Negative Shear tendency observed over J&K Himachal Pradesh North Central India and Positive Shear tendency over rest parts of India.

Positive Vorticity field at 850 hPa is observed over J&K Himachal Pradesh Punjab Haryana Uttarakhand Uttar Pradesh Bihar North-East Madhya Pradesh Chhattisgarh Jharkhand.

Precipitation:

IMR:

Rainfall upto 01-50 mm observed over Jammu and Kashmir North Himachal Pradesh North Kerala South Interior Karnataka South Chhattisgarh adjoining Andhra Pradesh

RADAR and RAPID RGB Observation:

Isolated/multiple significant echoes were seen on DWR Kolkata (max. dBZ 50-55 and height>15km), Agartala (dBZ around 50 and height>10km) and Machilipatnam (dBZ around 50 and height>10km) at around 1500 IST. Light to moderate isolated/multiple light to moderate echoes were also seen in DWR Chennai, Thiruvananthapuram, Visakhapatnam, Srinagar, Hyderabad and Patna at around 1500 IST.

RAPID RGB Satellite imagery at 1400 IST indicates significant convection over East Bangladesh, Manipur and Mizoram; convection also appears to be in progress over East Jharkhand, North Coastal Andhra Pradesh, Tamilnadu 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. Widespread higher concentration of dust is observed over North India. Higher concentration of dust to persist for next two days.

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

Delhi – SAFAR analysis & Forecast	21.04.2018	22.04.2018
PM10 (micro-g/m ³)	355	337
PM2.5 (micro-g/m ³)	113	108

2. NWP MODEL GUIDANCE:

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

1. Weather Systems:

Low level Cycirs, Troughs:

12UTC of Day 0-3: 925 & 850 hPa trough over WB-Bihar region

00UTC of Day 0-3: 925 & 850 hPa NE-SW trough over Maharashtra extending to east UP

Confluence & Wind Discontinuity Regions:

12 UTC of Day 0-2: 925& 850 hPa N-S discontinuity over Southern Peninsular India and in Day 0-4 SW-NE discontinuity over MP Chhattisgarh & Odisha

Synoptic Systems: 12 UTC of Day 0-2:

12 UTC of Day 0-1: WD as a trough over J &K

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

3. Convergence at 850 hPa:

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

Day0: Jharkhand, Odisha, Chhattisgarh, Telangana, SI_Karnataka,

Day1: Assam_Meghalaya, NE_NMMT, Gangetic_WB, Odisha, Telangana, Coastal_Karnataka, NI_Karnataka, SI_Karnataka,

Day2: Jharkhand, Odisha, Madhya_Maharashtra, Marathwada, Telangana, NI_Karnataka,

Day3: Assam_Meghalaya, Jharkhand, Odisha, East_MP, Madhya_Maharashtra, Chhattisgarh, Rayalseema, NI_Karnataka, SI_Karnataka, Kerala,

Day4: NE_NMMT, Odisha, Madhya_Maharashtra, Rayalseema, TN_Puducherry, SI_Karnataka.

4. Low level Vorticity:-Positive Vorticity:

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

Day0: Arunachal_Pradesh, Assam_Meghalaya, TN_Puducherry,

Day1: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Uttarakhand, Himachal_Pradesh,

Day2: Arunachal_Pradesh, Assam_Meghalaya, Sub_Himalayan_WB, Himachal_Pradesh,

Day3: Arunachal_Pradesh, Assam_Meghalaya, Sub_Himalayan_WB, Gangetic_WB,

Day4: Gangetic_WB, Bihar, Odisha.

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

Day/Index: Subdivisions with Showalter Index < -4

Day0: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Jharkhand, Bihar, Uttarakhand, Jammu_Kashmir, Odisha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, Coastal_Karnataka, SI_Karnataka, Kerala,

Day1: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Bihar, Uttarakhand, Himachal_Pradesh, Jammu_Kashmir, Odisha, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, TN_Puducherry, Coastal_Karnataka, SI_Karnataka, Kerala,

Day2: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Bihar, Uttarakhand, Jammu_Kashmir, Odisha, Konkan_Goa, Madhya_Maharashtra, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, TN_Puducherry, Coastal_Karnataka, NI_Karnataka, SI_Karnataka, Kerala,

Day3: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Uttarakhand, Himachal_Pradesh, Jammu_Kashmir, Odisha, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, Coastal_Karnataka, NI_Karnataka, SI_Karnataka, Kerala,

Day4: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Bihar, Uttarakhand, Himachal_Pradesh, Jammu_Kashmir, Coastal_AP, Rayalseema, TN_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, Sub_Himalayan_WB, Gangetic_WB, Jharkhand, Bihar, Uttarakhand, Hry_Chhd_Delhi, Punjab, Himachal_Pradesh, Jammu_Kashmir, Odisha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, Coastal_Karnataka, SI_Karnataka, Kerala,

Day1: Arunachal_Pradesh, Sub_Himalayan_WB, Gangetic_WB, Bihar, Uttarakhand, Punjab, Himachal_Pradesh, Jammu_Kashmir, Odisha, Guj_Reg, Konkan_Goa, Madhya_Maharashtra, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, TN_Puducherry, SI_Karnataka,

Day2: Arunachal_Pradesh, Sub_Himalayan_WB, Bihar, Uttarakhand, Himachal_Pradesh, Jammu_Kashmir, Odisha, Konkan_Goa, Madhya_Maharashtra, 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, Uttarakhand, Himachal_Pradesh, Jammu_Kashmir, Odisha, Chhattisgarh, Coastal_AP, Telangana, Coastal_Karnataka, NI_Karnataka,

Day4: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Jharkhand, Bihar, Uttarakhand, Himachal_Pradesh, Jammu_Kashmir, Odisha, Telangana, Rayalseema, SI_Karnataka, Kerala

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, Bihar, Odisha, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, Coastal_Karnataka, SI_Karnataka, Kerala,

Day1: Arunachal_Pradesh, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Odisha, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, Coastal_Karnataka, SI_Karnataka, Kerala,

Day2: Arunachal_Pradesh, Sub_Himalayan_WB, Odisha, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, Coastal_Karnataka, NI_Karnataka, SI_Karnataka, Kerala,

Day3: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Uttarakhand, Himachal_Pradesh, Jammu_Kashmir, Odisha, Vidarbha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, Coastal_Karnataka, NI_Karnataka, SI_Karnataka, Kerala,

Day4: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Sub_Himalayan_WB, Gangetic_WB, Uttarakhand, Himachal_Pradesh, Odisha, Chhattisgarh, Coastal_AP, Telangana, Rayalseema, TN_Puducherry, NI_Karnataka, SI_Karnataka, Kerala,

8. Rainfall and thunder storm activity:

Day/Index : Subdivisions with Precipitation > 2 cm

- Day1: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Kerala,
Day2: Arunachal_Pradesh, Assam_Meghalaya, NE_NMMT, Gangetic_WB,
Day3: Arunachal_Pradesh, Assam_Meghalaya,
Day4: Arunachal_Pradesh, Assam_Meghalaya, Odisha,
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 west Uttar Pradesh and adjoining Haryana. The forecast shows it will become less marked in next 24 hours. The analysis indicates a North- South Trough extending from East Uttar Pradesh to East Vidarbha across East Madhya Pradesh in lower troposphere. The forecast shows the south eastward shift of the trough till day3. Another cyclonic circulation is seen in the analysis over SHWB and adjoining areas. The forecast shows it will persist for next 72 hours. An East-west trough is seen in the analysis extending from Jharkhand to east Assam across the above cyclonic circulation. The forecast shows it will persist for next 72 hours with slight eastward shift. The analysis shows a North-South Trough extending from North Interior Karnataka to south Tamil Nadu across south Interior Karnataka and Kerala. It will persist for next 3 days in the forecast. A feeble cyclonic circulation is seen over parts of south west Rajasthan 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 10⁻¹/s):

Low level Positive Vorticity is seen mostly along the foothills of Himalaya from J&K, Himachal Pradesh and Uttarakhand to NE states and along the north- south trough for next 3 days. Low level Positive Vorticity is also seen over. It is inferred that East and North east India has Positive Vorticity from day 1 onwards and southern parts of central India has Positive Vorticity on day 2 and 3.

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

the index is seen over parts of GWB, Orissa, Andhra Pradesh, coastal Maharashtra, Karnataka, Konkan and Goa, Bihar, Jharkhand, Chhattisgarh, coastal Tamil Nadu, Telangana during next 3 days.

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, Assam, Arunachal Pradesh, Meghalaya, Mizoram, Nagaland, Tripura and adjoining areas on all 3 days; over parts of Uttar Pradesh, adjoining north east Madhya Pradesh and west Madhya Pradesh on day 1; maximum negative value of the index less than -10 is seen over parts of Bihar, Jharkhand and adjoining GWB on day 1 and 3; over some parts of Orissa and SHWB on day 3.

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

Sweat Index (> 300): Although the threshold value of the Index >300 is seen in most parts of the country except central parts of Madhya Pradesh and west Rajasthan on day 1, over most of the parts of country except Rajasthan, Punjab, Haryana, Delhi, Uttar Pradesh, central parts of Madhya Pradesh, northern parts of Chhattisgarh, Madhya Pradesh, Marathwada and west Vidarbha on day 2; and 3; maximum value of the index greater than 800 is seen over parts of SHWB, GWB and Orissa on day 1; over parts of Orissa, adjoining GWB and coastal Andhra Pradesh on day 3.

CAPE (> 1000): Mostly in areas of southern peninsular India, along west coast and east coast, parts of Orissa, Andhra Pradesh, Telangana, Rayalaseema, Kerala, Tamil Nadu, Karnataka, coastal Maharashtra including Mumbai, Konkan and Goa, Gujarat, Bihar, Jharkhand, Chhattisgarh, GWB, SHWB, Sikkim, Assam, Meghalaya, Tripura and adjoining areas during next 3 days; over parts of East Uttar Pradesh and East Vidarbha on day 1; Maximum value of the index greater than 2500 is seen mostly over parts of SHWB, GWB, coastal Orissa, Jharkhand, Andhra Pradesh, Coastal Tamil Nadu, coastal Kerala and Telangana during next 3 days; over parts of Coastal Karnataka, Kerala, south coastal Maharashtra, Karnataka, Konkan & Goa on day 1; over parts of Bihar, coastal Karnataka and Kerala on day 2; over parts of Assam, Tripura and adjoining areas coastal Kerala and south coastal 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, Rajasthan, south east Madhya Pradesh, west Vidarbha, Madhya Maharashtra, Marathwada on day 1; over most of the parts of the country except J&K, Punjab, Himachal Pradesh, Uttarakhand, Haryana, Delhi, Rajasthan, Uttar Pradesh, Madhya Pradesh, north Chhattisgarh, Vidarbha, Madhya Maharashtra, Marathwada on day 2 and 3; maximum value of the index is seen over north coastal Maharashtra including Mumbai and adjoining areas on day 3..

5. Rainfall Activity:

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

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

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

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

1. Model Reflectivity (Max. dBZ): > 25 dBZ Model Reflectivity:

Over parts of J&K, Bihar, Jharkhand, GWB, Kerala, Tamil Nadu, Sikkim and NE states on day 1; over parts of Sikkim, NE states, GWB adjoining Jharkhand and Orissa on day 2; over parts of Orissa, Assam, Arunachal Pradesh, Meghalaya, Tripura, Mizoram, Nagaland and adjoining areas on day 3; maximum value of the Model reflectivity is seen over parts of GWB, Assam, Meghalaya, Tripura and adjoining areas on day 1; over some parts of Orissa and adjoining GWB on day 3.

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

Total Index (> 50): Above threshold value is observed over most parts of the country except extreme south peninsular India, extreme southern parts of west coast and the east coast, southern parts of Andhra Pradesh, south interior Karnataka, Konkan and Goa, south coastal Maharashtra, Sikkim, GWB and NE states during all 3 days; below threshold value is seen over some parts of Bihar, Jharkhand, Chhattisgarh, Orissa, Telangana and North Interior Karnataka on day 1; over parts of Telangana, Bihar, Jharkhand and North Interior Karnataka on day 2; on day 3 over some parts of Orissa and south coastal Maharashtra; maximum value of the index is seen over parts of Madhya Pradesh, Madhya Maharashtra, Marathawada, Vidarbha, Jharkhand, Telangana, Orissa, Chhattisgarh, Andhra Pradesh and Karnataka during next 3 days; over parts of Bihar, East Uttar Pradesh and GWB on day 1; over parts of Southeast Rajasthan on day 2; over parts of East Rajasthan, Gujarat and GWB on day 3.

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

CAPE (> 1500): Greater than threshold value over parts of Gujarat, coastal areas of west coast, coastal Maharashtra, Konkan and Goa, coastal areas along the east coast, southern parts of Madhya Maharashtra, Vidarbha, Bihar, Jharkhand, Chhattisgarh, Orissa, GWB and Kolkata, SHWB, parts of Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Telangana, Rayalaseema, Extreme south peninsular India and NE states on all 3 days; over some parts of East Uttar Pradesh on day 1; Maximum value of the index greater than 3500 is seen over the parts of Karnataka, coastal Kerala, coastal Orissa, coastal Andhra Pradesh, coastal Maharashtra, Konkan and Goa, GWB, SHWB, coastal Tamil Nadu, Telangana, south Chhattisgarh and Jharkhand on day 1; over parts of GWB, coastal Orissa, coastal Andhra Pradesh, coastal Tamil Nadu, SHWB, Assam and adjoining areas, Karnataka, Konkan and Goa, Kerala, Telangana and Jharkhand on day 2; over parts of GWB, coastal Orissa, coastal Andhra Pradesh, SHWB, Assam and adjoining areas, Karnataka, Konkan and Goa, Kerala and coastal 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 J&K, Punjab, Himachal Pradesh, Uttarakhand, Haryana, Delhi, and Madhya Pradesh, north Chhattisgarh, west Vidarbha, North Madhya Maharashtra and Marathawada during next 3 days; the maximum value of the index > 400 is seen over East Uttar Pradesh, Bihar, Jharkhand, GWB, Orissa, Chhattisgarh, Southern parts of Coastal Maharashtra on day 1; over parts of coastal Gujarat, coastal Maharashtra and Orissa on day 2; over parts of coastal Maharashtra including Mumbai, Vidarbha, Chhattisgarh, Telangana, Andhra Pradesh, Orissa and south Madhya Maharashtra on day 3..

3. Rainfall and thunderstorm activity:

70- 130 mm Rainfall: over parts of Assam, Meghalaya, Tripura and adjoining areas on day 1 and 2.

40-70 mm Rainfall: over parts of Assam, Meghalaya, Tripura, Mizoram, Nagaland and adjoining areas during next 3 days; over parts of Kerala, Tamil Nadu, GWB and Sikkim on day 1; over some parts of Arunachal Pradesh on day 3.

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

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

3. IOP ADVISORY FOR 24 and 48Hrs:

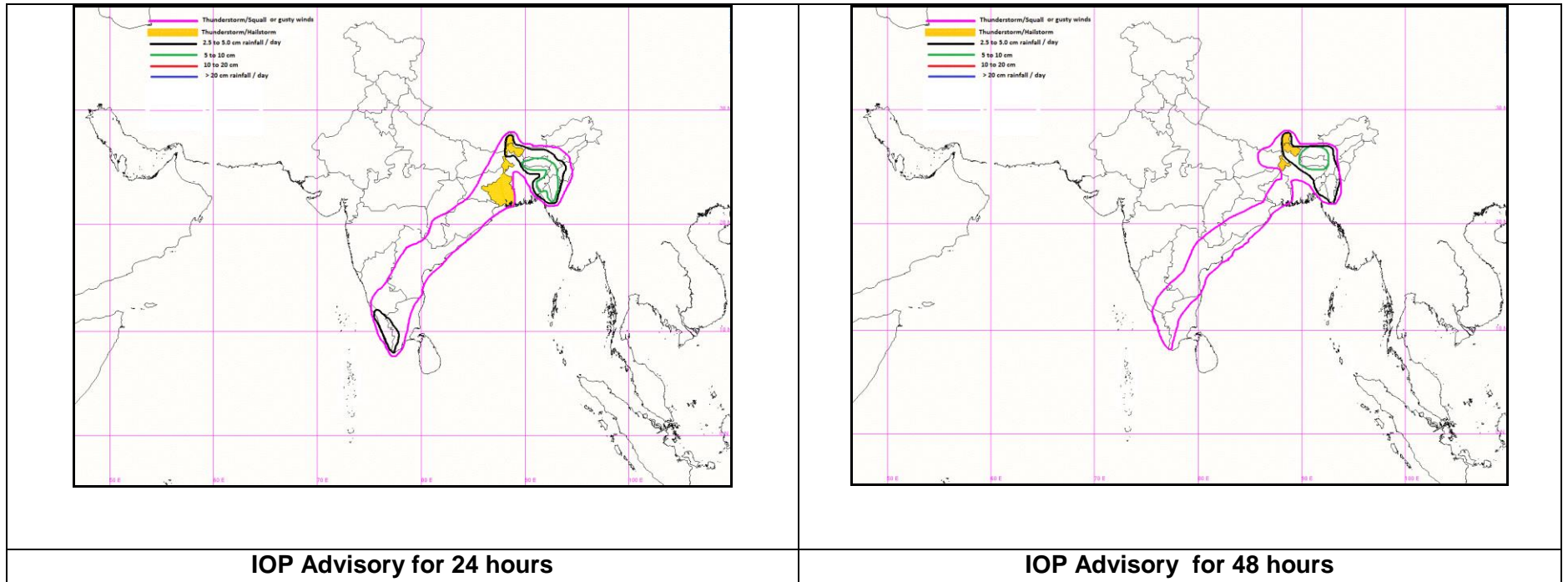
Summary and Conclusions:

- o Most thermodynamic indices (T-STORM Initiation Index, K-Index, Lifted Index, CAPE, CINE) from IMD GFS deterministic model indicate high probability of thunderstorm occurrence along the east and south peninsular coast of India. The values decrease in spatial extent as well as intensity on day 2. SWEAT index which also accounts for the wind shear between 850 and 500 hPa levels, indicates a maximum probability of thunderstorms over West Bengal and coastal Odisha on day 1, decreasing on day 2. Reflectivity values from IMD WRF model indicate high probability of convection over Assam and Meghalaya, Tripura and Mizoram on day 1. The 850-200 hPa wind shear is very high over North India on day 1 and decreasing on day 2.
- o Synoptic analysis and NWP models indicate that there is a cyclonic circulation in the lower levels over West Uttar Pradesh and adjoining Haryana. However, this is a dry circulation and is likely to give dry dust raising winds over Haryana, and isolated thunderstorms/duststorms over UttarPardesh on day 1. This is likely to decrease thereafter.
- o Synoptic analysis also indicates that the cyclonic circulation over SubHimalayan West Bengal and adjoining west Assam persists and an eastwest trough at lower levels runs from Jharkhand to east Assam across the circulation. There is also a north-south trough extending from East Uttar Pradesh to eastern parts of Vidharbha and a north-south wind discontinuity in the lower levels from southeast Madhya Pradesh to south Tamilnadu. During the course of the day, on the windward side of the trough, moisture is likely to be pumped in from the Bay of Bengal on the periphery of the anticyclone. This is likely to result in widespread thunderstorm activity all along the east coast of India and northward into East and North East India on day 1. On day 2, ECMWF and IMD GFS deterministic model indicate that the northward end of the trough is likely to shift slightly southwards and the rainfall and thunderstorm zone is likely to change accordingly.

Day-1 & Day-2:

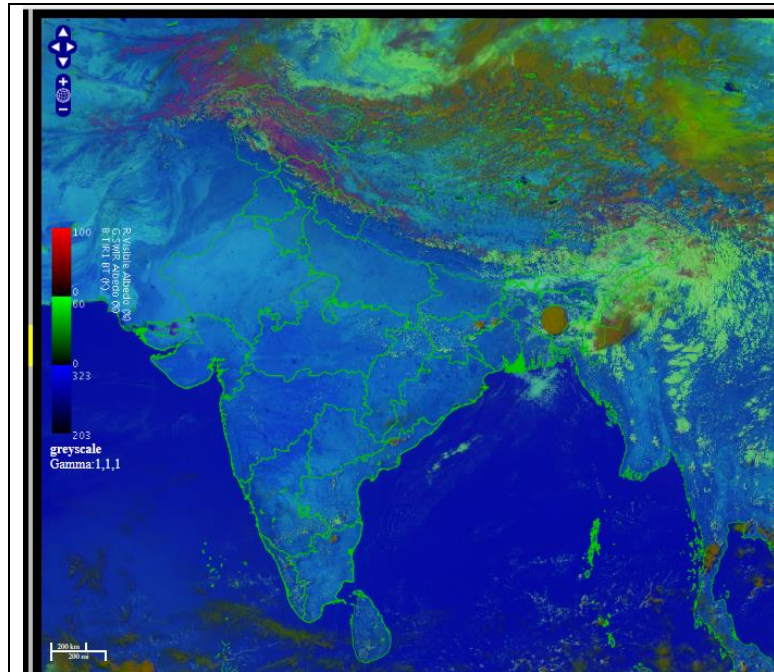
24hour Advisory for IOP:	48hour Advisory for IOP:
Significant Rainfall: South and West Assam and Meghalaya, Nagaland, Manipur, Mizoram and Tripura Sub Himalayan West Bengal & Sikkim Interior Tamil Nadu, Kerala	Significant Rainfall: South and west Assam and Meghalaya, Nagaland, Manipur, Mizoram and Tripura Sub Himalayan West Bengal & Sikkim
Thunderstorm with squall or gusty winds: Interior Tamil Nadu, Kerala, South Interior Karnataka, Rayalaseema, East Telangana, Coastal Andhra Pradesh, Chhattisgarh, Bihar, East Jharkhand, Odisha Tripura, Mizoram, Manipur, South and west Assam and Meghalaya	Thunderstorm with squall or gusty winds: Interior Tamil Nadu, Kerala, South Interior Karnataka, Rayalaseema, East Telangana, Coastal Andhra Pradesh, Chhattisgarh, Gangetic West Bengal, Bihar, Odisha Tripura, Mizoram, Manipur, South and west Assam and Meghalaya
Thunderstorm with squall and hail Gangetic West Bengal, Sub Himalayan West Bengal & Sikkim	Thunderstorm with squall and hail Sub Himalayan West Bengal & Sikkim
Thunderstorm/Duststorm: Uttar Pradesh	

Graphical Presentation of Potential Areas for Severe Weather:

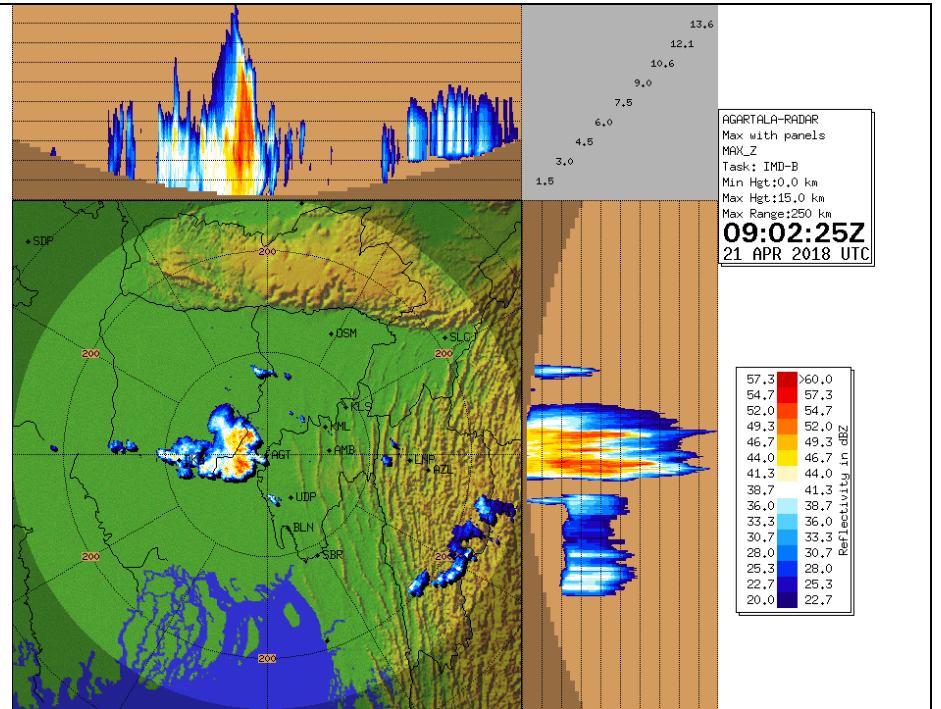


IOP Advisory for 24 hours

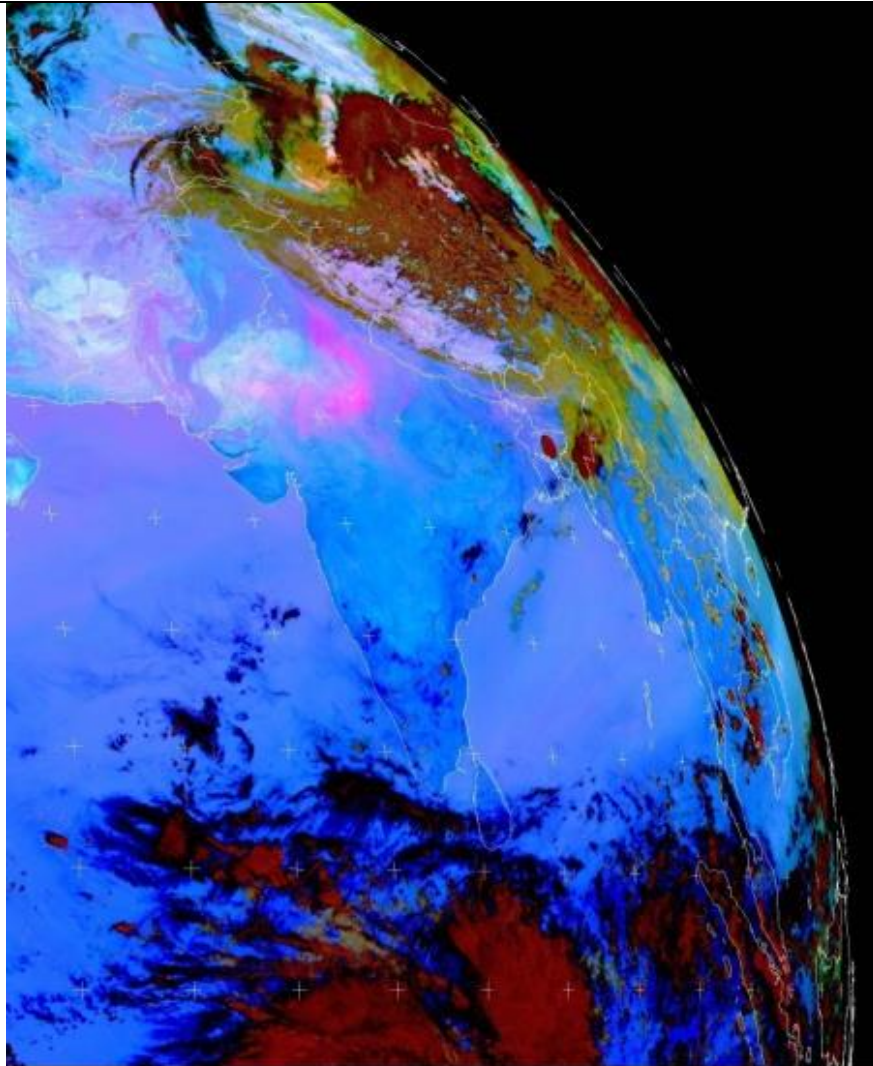
IOP Advisory for 48 hours



RAPID RGB Imagery at 1400 IST of the Day



DWR Machilipatnam at 1432 IST of the Day

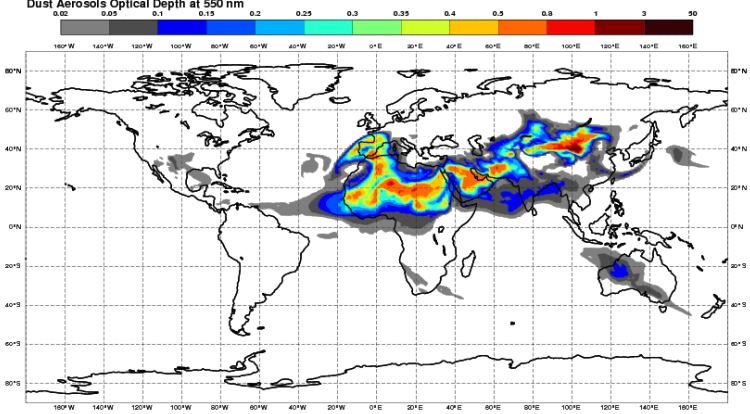


 **EUMETSAT**

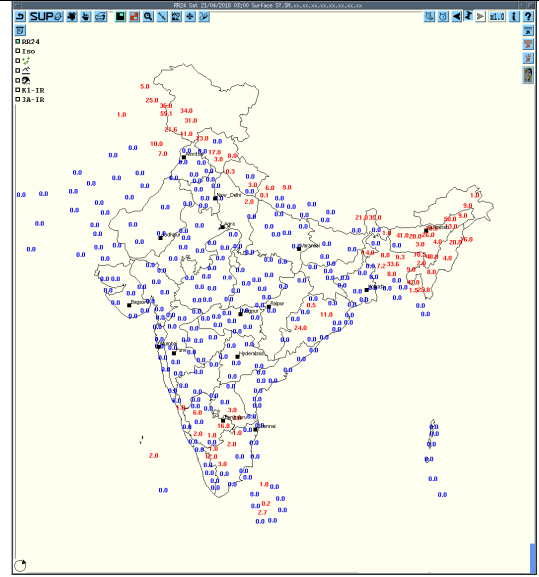
Meteosat IODC Dust, 2018-04-21 08:00:00

Observed Satellite Dust Image on 2018-04-21:08:00 UTC

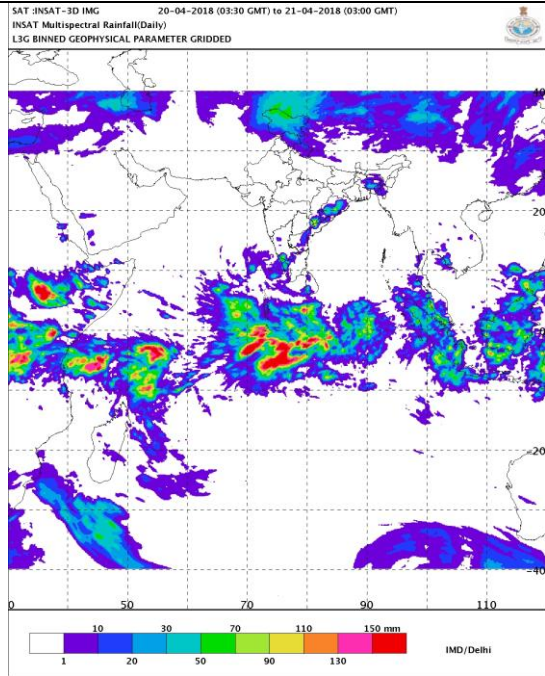
Friday 20 April 2018 00UTC CAMS Forecast t-120 VT: Wednesday 25 April 2018 00UTC



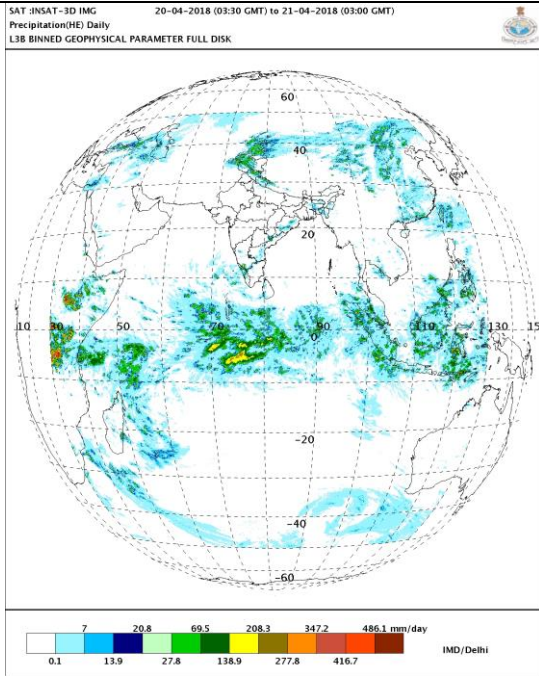
Dust Forecast



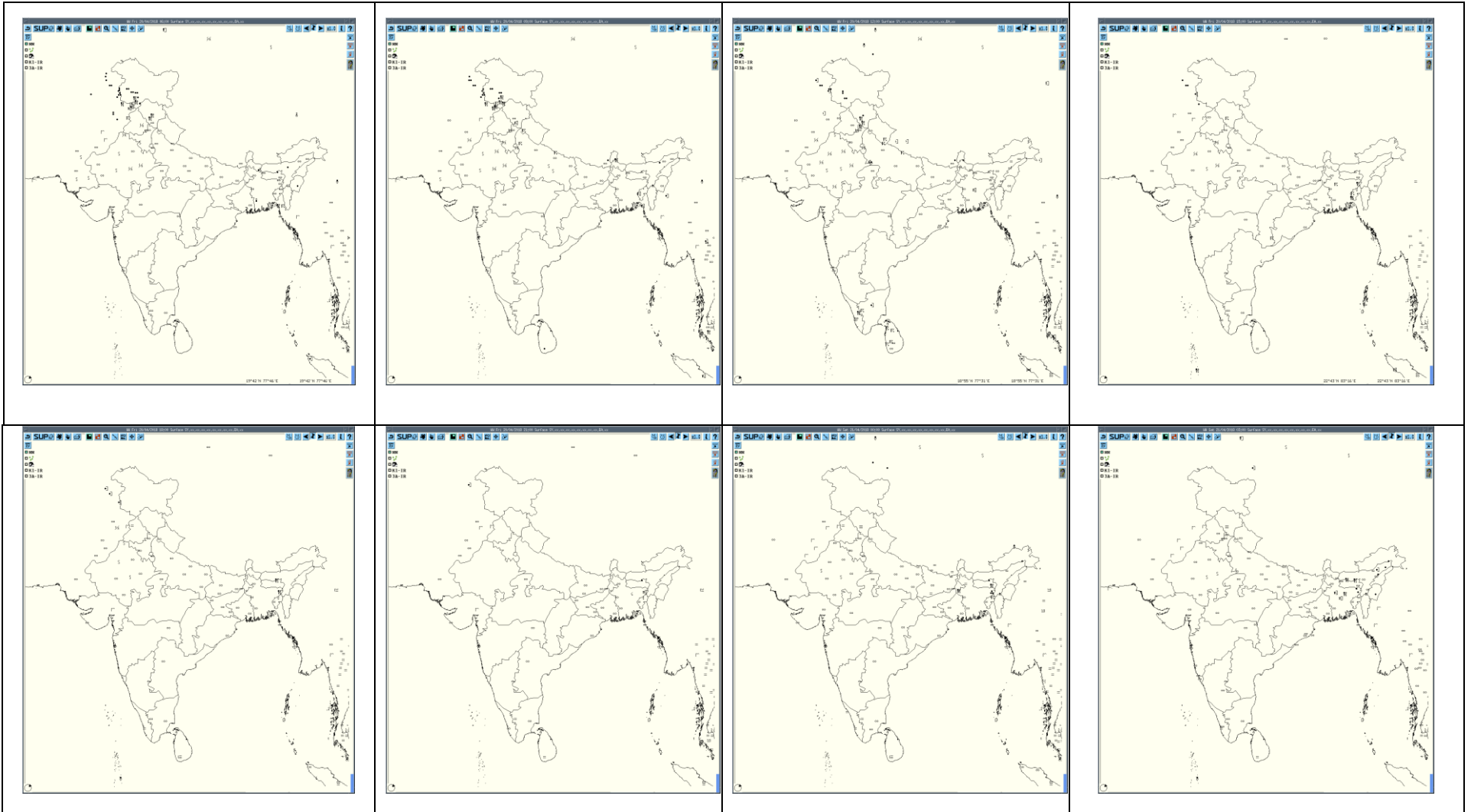
Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today



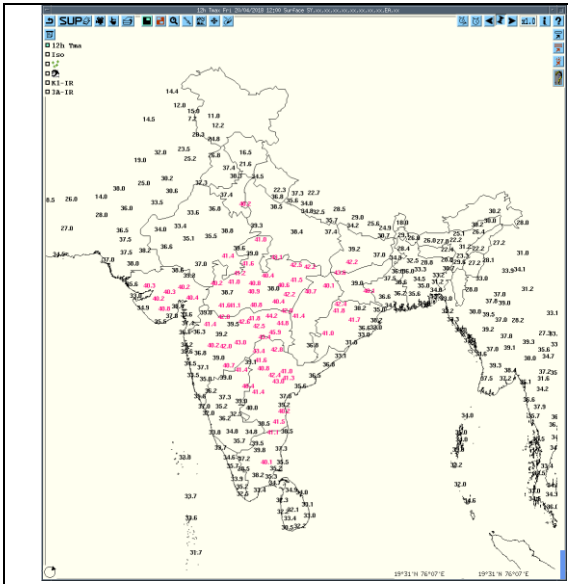
IMR



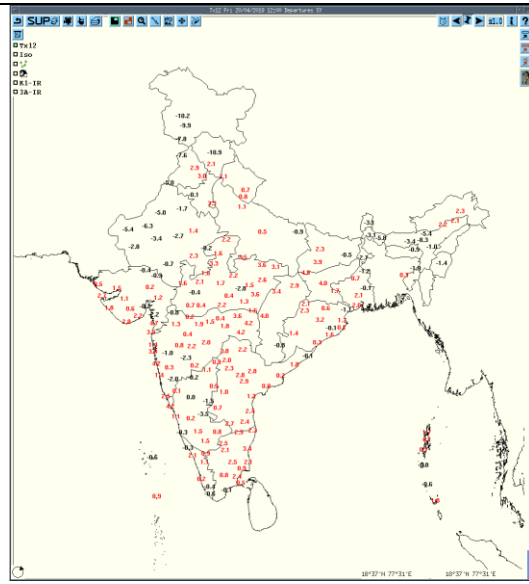
HEM



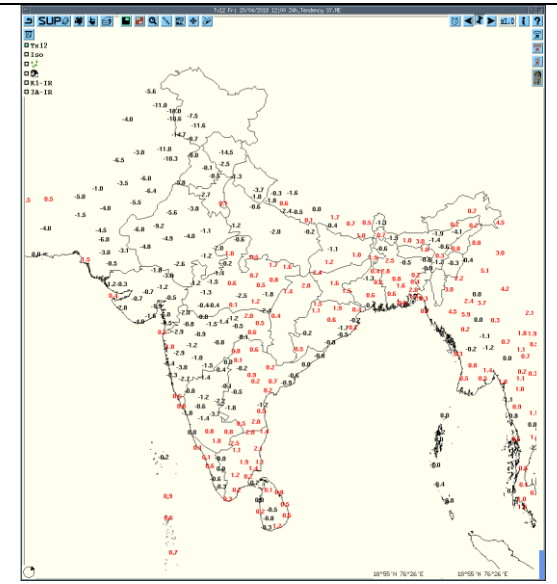
3hourly Past weather at 06, 09, 12, 15, 18, 21 UTC of yesterday and 00 & 03 hrs UTC of today



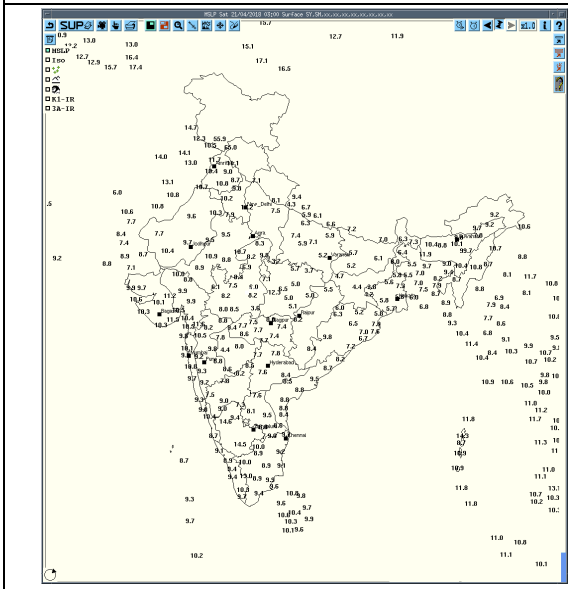
Tmax



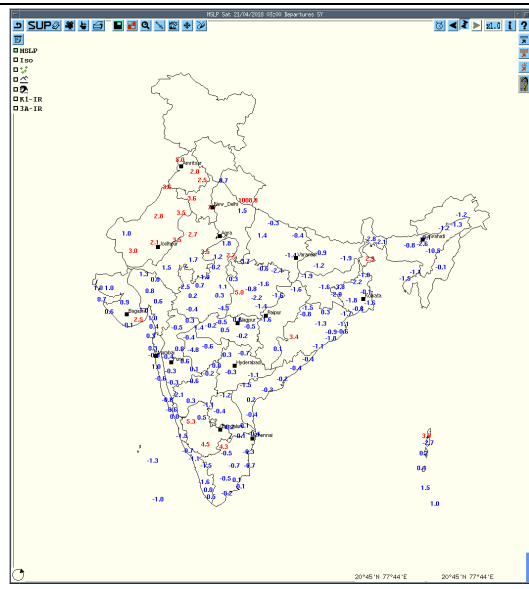
Departure Tmax



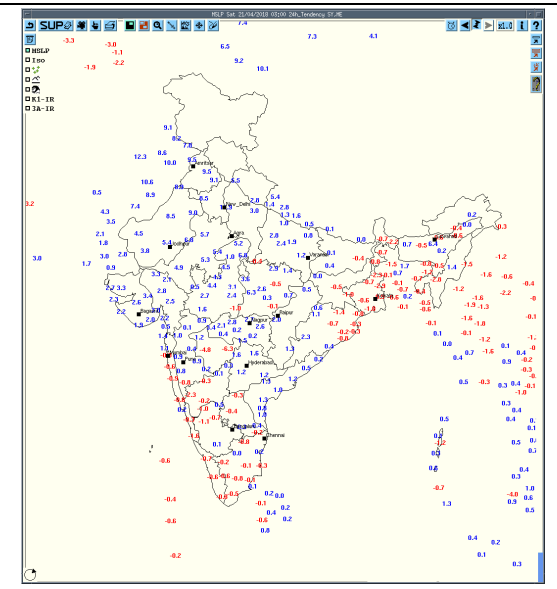
Tendency Tmax



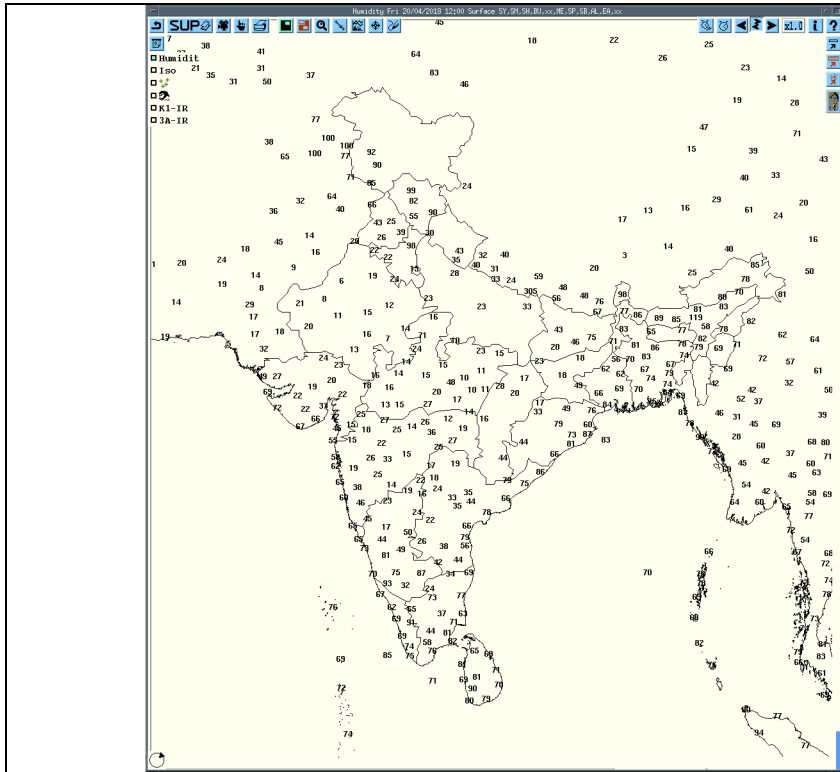
MSLP



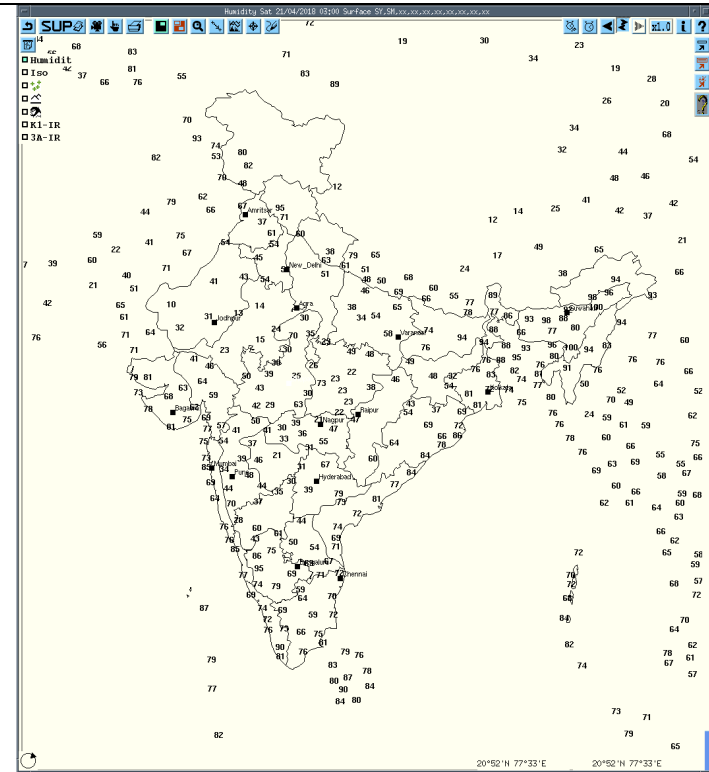
Departure MSLP



Tendency MSLP



RH at 12UTC yesterday



RH at 03UTC today

Past 24 hours DWR Report:

Radars Station name	Date	Time interval of observation (UTC)	Organization of the cells (Isolated single cells/multiple cells/convective regions/squall lines) with height of 20 dBZ echo top and maximum reflectivity	Formation w.r.t radar station and Direction of movement	Remarks	Associated severe weather if any	Districts affected
Patiala	21-04-18	200300-200600	Multiple echoes Reflectivity: 53.5 dbz Ht. 09 kms.	NE SECTOR Dir. NE - ly	_____	Duststorm/ Thunderstorm/ Rain	Nangal Dam. Bilaspur
		200600-200900	Multiple echoes Reflectivity: 50.0 dbz Ht. 10-12 kms.	NW, NE, SE SECTORS Dir. NE - ly	_____	Duststorm/ Thunderstorm/ Rain	Hoshiarpur, Nadaun, Una, Hamirpur, Mandi, Kalsi, Saharanpur, Behat
		200900-201200	Multiple echoes Reflectivity: 56.5 dbz Ht. 10-11 kms.	SE,NE sectors Dir. NE - ly	_____	Duststorm/ Thunderstorm/ Rain	Ambala, Rajpura, Chandigarh, Solan, Shimla, Morinda, Roop Nagar, Nangal dam, Bilaspur, Hamirpur, Mandi.
		201200-201500	Multiple echoes Reflectivity: 53.5 dbz Ht. 08-10 kms.	NE/ SE Sectors Dir. NE-ly	_____	Duststorm/ Thunderstorm/ Rain	Behat, Kalsi, Solan, Shimla, DDN, Mussoorie, Rampur
		201500 - 201800	Multiple echoes Reflectivity: 40.0 dbz Ht. 09-10 kms.	NE SECTOR DIR. NE-ly	_____	Duststorm/ Thunderstorm/ Rain	Nahan, Shimla, Bilaspur, Sundernagar.
		201800-210252	No Echo	--	--	--	--
Jaipur	21-04-18	200302-200422	Multiple cell with average height of 6.0 km & maximum reflectivity 45.5 dBZ	Multiple cell continue from 0300 UTC of 20/04/2018 towards E,SE of Jaipur and moved to E & SE Wards at speed 08-10 km/hr.	Multiple cell continue from 0300 UTC of 20/04/2018 towards E,SE of Jaipur and reaches maximum reflectivity during 0322 UTC OF 20/04/2018 and died to 0422 UTC OF 20/04/2018	Thunderstorm, dust storm with Light rain at Isolated places	BHARATPUR, DHOLPUR, KARULI, SAWAIMADHOPUR Districts
Patna	21-04-18	200300-210300	Nil	Nil	Nil	Nil	Nil

Radars Station name	Date	Time interval of observation (UTC)	Organization of the cells (Isolated single cells/multiple cells/ convective regions/ squall lines) with height of 20 dBZ echo top and maximum reflectivity	Formation w.r.t radar station and Direction of movement	Remarks	Associated severe weather if any	Districts affected
Visakhapatnam	21-04-18	200900	Multiple cells with maximum reflectivity of 62dBz with height of 18kms	NW(60 to 150KMS), N(200 to 230 KMS) & NE(225 KMS) moving SEly	CB cells are formed at 0631UTC , developing and matured well at 0811UTC to max. reflectivity of 62dBz.	Heavy R/F may take place with severe thunderstorms	Vizianagaram, Visakhapatnam Dist. (AP) Ganjam and Rayagada Dist. (Orissa)
		201200	Multiple cells with maximum reflectivity of 58dBz with height of 18kms	W(66 KMS), NW(79 KMS) N(180,242 KMS) & NE(216 KMS) moving SEly	Since last observation cb cells developing and matured. From 1031UTC onwards CB cells are start dissipating.	Heavy R/F may take place with severe thunderstorms	Vizianagaram, Visakhapatnam Dist. (AP) Ganjam and Rayagada Dist. (Orissa)
		201500	Multiple cb cells out of which one at NNE with max reflectivity 59dbz and height 13kms.	Since last observation .cb(N)(232KMS), CB(W)(207KMS), CB(NW)(229KMS) and moving SEly	Massive cb cell formed at 13:51UTC.	Heavy R/F may take place with severe thunderstorms.	KANDHARMA L(ODISSA)
		201800	Multiple strong cb cells WSW and NNE with max reflectivity 59 dbz(WSW) height 14kms.	Since last observation. 214KMS(WSW) 15:01UTC &69KMS(NNE) 15:01UTC. Moving SEly.	Max reflectivity for cb(WSW).	Moderate to severe thunderstorms may prevail.	SRIKAKULAM DT (AP) and EAST GODAVARI DISTRICTS(AP).
		210000	A line of cb cells with max reflectivity 53dbz and height 7kms.	158kms (NE) and moving SE ly.	Formed at 19:11 UTC. Likely to be intensified.	Likely to be intensified	GAJAPATI, GANJAM DIST.(ODISSA)
		210300	Isolated cb cells with max reflectivity 42dbz and height 9kms.	190kms of NE and moving SE ly.	CB cells formed in Bay of Bengal and developed to Max. intensity of 42dbz at 0001utc and dissipated at 0051UTC		In Bay of Bengal

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	Associated severe weather, if any	Districts affected
Lucknow	21/04/2018	200302-200522	Multiple cell with average height of 6.0 KM with Maximum Reflectivity of 38.5dBZ.	W(100KM) to WNW(100KM). Moving E'ly Direction at speed of 67 km/hr.	Previously stable system disappear at 05:22UTCENE(75KM) from Radar station.	NIL	NIL
		201152-201242	Single Cell with average height of 9.0 KM with Maximum Reflectivity of 42dBZ.	NNW(240KM) moving in NE'ly Direction at speed of 60 km/hr.	Single cell dissipated at 12:42 UTC at NWN(220KM)) from Radar station.	NIL	NIL
		201212-201242	Single Cell with average height of 9.0 KM with Maximum Reflectivity of 42 dBZ	WNW(225KM) moving in E'ly Direction at speed of 30 km/hr.	Single cell dissipated at 12:42 UTC at WNW(210KM)) from Radar station.	NIL	NIL
		201532-201642	Single Cell with average height of 8.8KM with Maximum Reflectivity of 40.5 dBZ	NW(240KM) moving in ENE'ly Direction at speed of 65 km/hr.	Single cell converted in to Multiple cells anddissipated at 16:42 UTC at NNW(220KM)) from Radar station.	NIL	NIL
		201552-201912	Multiple Cell with average height of 7.9KM with Maximum Reflectivity of 47.0 dBZ	N(40 to 60 KM) moving in ENE'ly Direction at speed of 60 km/hr.	Multiple cellsintencified and converted in to more cells and dissipated at 19:12 UTC at ENE(150KM) from Radar station.	NIL	NIL
		201912-202012	Multiple Cell with average height of 8.0 KM with Maximum Reflectivity of 41.0 dBZ	N(150KM) moving in ENE'ly Direction at speed of 55km/hr.	Single cell converted in to Multiple cells and dissipated at 20:12 UTC at NNE(175KM)	NIL	NIL
		202032-202122	Multiple Cell with average height of 7.2 KM with Maximum Reflectivity of 42.5 dBZ	NNE(100KM) and ENE(130KM moving in E'ly Direction at speed of 60 km/h	Multiple cell dissipated at 21:22 UTC at NE(125 to 135KM) and ENE(170KM) from Radar station	NIL	NIL
		202122-210300	No Significant weather	NIL	NIL	NIL	NIL

Radar Station Name	Date	Time Interval of Observation (UTC)	Organisation of cells (Isolated single cells /multiple cells/ convective regions /squall lines) with height of 20 dBZ echo top and maximum reflectivity	Formation w.r.t. radar station and Direction of movement	Remarks	Associated Severe Weather if any	Districts affected
Kolkata	21-04-18	200301-200902	NIL	NIL	NOSIG ECHO	NIL	NIL
		200902-201131	Isolated cell with maximum reflectivity of 58.5 dBz at 1032 UTC and maximum height of 11.02 Km at 0942 UTC	NNW (263.5 km) Moving in E-ward direction.	Cell started forming at 0911 UTC at NNW (236.9 Km) from radar. Matured, dissipated in North	Thunderstorm/ Rain	N/A
		201131-202242	NIL	NIL	NOSIG ECHO	NIL	NIL
		202252-200131	Isolated cell with maximum reflectivity of 63.5 dBz at 2331 UTC and maximum height of 14.51 Km at 2342 UTC	NNW (221.5 km) Moving in ESE-ward direction.	Cell started forming at 2252 UTC at NNW (221.5 Km) from radar. Matured, transformed into multi-cell system, later moving into Bangladesh at 0131 UTC in NNE a distance 179.4 km from radar	Thunderstorm/ Rain	N/A
		210142-210302	NIL	NIL	NOSIG ECHO	NIL	NIL

Realised past 24hrs TS/SQ/HS Data:

RealisedTS/HS/SQduringpast24hoursendingat0300UTCoftoday(receivedfromRMCs/MCs)						
Name of Station Reporting	Region	State/Sub Division	Weather Event (TS/Hail/Squall)	Date	Time of Commencement (IST)	Time of end (IST)
Srinagar	Northwest India	Jammu & Kashmir	Thunderstorm	20-04-18	1140 1445 1645	1150 1530 1730
Qazigund	Northwest India	Jammu & Kashmir	Thunderstorm	20-04-18	1045 1510	1330 1610
Pahalgam	Northwest India	Jammu & Kashmir	Thunderstorm	20-04-18	1500 1630	1515 1730
Kukernag	Northwest India	Jammu & Kashmir	Thunderstorm	20-04-18	201030 201158 201530 210200	201035 201250 201600 210240
Jammu	Northwest India	Jammu & Kashmir	Thunderstorm	20-04-18	0900 1050 1345	0925 1100 1545
Banihal	Northwest India	Jammu & Kashmir	Thunderstorm	20-04-18	0905	1700
Batote	Northwest India	Jammu & Kashmir	Thunderstorm	20-04-18	1020	1810
Katra	Northwest India	Jammu & Kashmir	Thunderstorm	20-04-18	1000 1420	1040 1620
Bhaderwah	Northwest India	Jammu & Kashmir	Thunderstorm	20-04-18	1130	1800
Gulmarg	Northwest India	Jammu & Kashmir	Thunderstorm	20-04-18	1250 1502	1300 1525
Shimla	Northwest India	Himachal Pradesh	Thunderstorm	20-04-18	1136 1355 1635	1140 1400 1830
Sundernagar	Northwest India	Himachal Pradesh	Thunderstorm	20-04-18	0841 1022 1446	0934 1200 2045
Dehradun	Northwest India	Uttarakhand	Thunderstorm	20-04-18	1355 1745	1510 1945
Pantnagar	Northwest India	Uttarakhand	Thunderstorm	20-04-18	1130	1300
Mukteshwar	Northwest India	Uttarakhand	Thunderstorm	20-04-18	1643 1750	1650 1810
Tehri	Northwest India	Uttarakhand	Thunderstorm	20-04-18	0910 1310 2050	1020 1510 2310
			Hailstorm (hail diameter: n/a)	20-04-18	1422	1430
Chandigarh	Northwest India	Uttarakhand	Thunderstorm	20-04-18	1520	1815
Bareilly	Northwest India	West Uttar Pradesh	Thunderstorm	20-04-18	2115	2150

Sahjahanpur	Northwest India	West Uttar Pradesh	Thunderstorm	20-04-18	1200	1300
Silchar	Northeast India	Assam	Thunderstorm	20-04-18	2300	0500
Dibrugarh	Northeast India	Assam	Thunderstorm	21-04-18	0500	0510
N/Lakhimpur	Northeast India	Assam	Thunderstorm	21-04-18	0100, 0230	0230, 0300
Tezpur	Northeast India	Assam	Thunderstorm	20-04-18	1800	1830
Dhubri	Northeast India	Assam	Thunderstorm	21-04-18	0200	0400
Guwahati	Northeast India	Assam	Thunderstorm	20/21-04-18	201905, 202145, 210815	202015, 202350, 210830
Barapani	Northeast India	Meghalaya	Thunderstorm	20-04-18	1150	1200
Shillong	Northeast India	Meghalaya	Thunderstorm	21-04-18	0400	0540
Kailasahar	Northeast India	Tripura	Thunderstorm	20/21-04-18	201420, 210510	201520, 210540
Agartala	Northeast India	Tripura	Thunderstorm	20-04-18	1230, 1930	1350, 2100
Gangtok	East India	Sikkim	Thunderstorm	20-04-18	1425	1430
Malda	East India	West Bengal (SHWB)	Thunderstorm	21-04-18	0455	0625
			Hailstorm (diameter: 1.0cm)	21-04-18	0501	0502
Jagdalpur	Central India	Chhattisgarh	Thunderstorm	20-04-18	1915	2130
Tirupati AP	South India	Rayalaseema	Thunderstorm	20-04-18	1442	1620
Karipur Airport	South India	Kerala	Thunderstorm	20-04-18	1745	2200
Kannur	South India	Kerala	Thunderstorm	20-04-18	1815	1900
Kozhikode	South India	Kerala	Thunderstorm	20-04-18	1835	1955
Thiruvananthapuram AP	South India	Kerala	Thunderstorm	20-04-18	1530	1800
Chamarajanagar	South India	Karnataka (SIK)	Thunderstorm	20-04-18	1650	1700
Madikeri	South India	Karnataka (SIK)	Thunderstorm	20-04-18	1520	1635
AMS HAL Bengaluru	South India	Karnataka (SIK)	Thunderstorm	20-04-18	1548 1843	1720 1900
Bengaluru City	South India	Karnataka (SIK)	Thunderstorm	20-04-18	1610	1700
Bengaluru KIAL	South India	Karnataka (SIK)	Thunderstorm	20-04-18	1607	2040

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

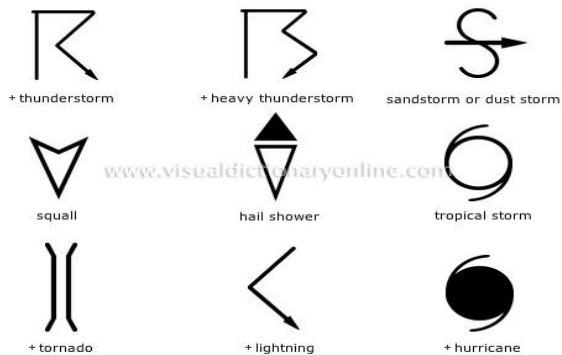
For Radar images of the past 24 hours including mosaic of images:

http://ddgmui.imd.gov.in/dwr_img/

Satellite sounder based T- Phigram

http://satellite.imd.gov.in/mAndhra_Pradesh_skm2.html

WEATHER SYMBOLS:



	haze
	smoke
	dust or sand storm
	fog
	drizzle
	rain
	snow
	showers
	hail
	thunderstorm

Weather Symbols