



**India Meteorological Department**  
**FDP STORM Bulletin No.79 (23-05-2017)**

**1. CURRENT SYNOPTIC SITUATION at 0300UTC of the Day:**

The upper air cyclonic circulation over Southeast Bay of Bengal & adjoining equatorial Indian Ocean, now lies over Southeast Bay of Bengal & neighbourhood and extends upto 4.5 Km above mean sea level.

A shear zone runs roughly along altitude 10.0°N at 3.1 km above mean sea level.

The Western Disturbance as an upper air cyclonic circulation over Jammu & Kashmir and adjoining Pakistan now lies over Jammu & Kashmir & neighbourhood between 3.6 km & 5.8 km, with a trough aloft runs roughly along Long. 74.0° E and north of Lat. 30.0°N.

The induced upper air cyclonic circulation over Punjab & neighbourhood between 1.5 and 2.1 Km above mean sea level persists.

The upper air cyclonic circulation over southwest Rajasthan & adjoining south Pakistan extending upto 2.1 Km above mean sea level persists.

The upper air cyclonic circulation over north Chhattisgarh & neighbourhood extending upto 0.9 km above mean sea level persists. The trough from this system to north coastal Andhra Pradesh across interior Odisha extending upto 0.9 Km above mean sea level also persists.

The upper air cyclonic circulation over southwest and adjoining west central Arabian Sea, now lies over western parts of west central Arabian sea & neighbourhood and extends upto 1.5 km above mean sea level.

The upper air cyclonic circulation over Rayalaseema & neighbourhood has become less marked.

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

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

**Convective Activity:**

| Cell No | Date/time (UTC)                 | Location/Area  | MIN CTT (- DEG C)    | Movement | Remarks    |
|---------|---------------------------------|--|----------------------|----------|------------|
| 1       | 23/0600<br>0700<br>0800<br>0900 | S C ASSAM ADJ MEGHA<br>C ASSM<br>EXT E ASSM<br>EXT E ASSM ADJ NAGA | 56<br>51<br>71<br>64 |          | DEVELOPING |
| 2       | 23/0900                         | NW BHR   | 76                   |          |            |
| 3       | 23/0900                         | EXT SE BHR ADJ JHRKND  | 76                   |          |            |

**Western Disturbance:**

Scattered multi-layered clouds seen over J & K, Himachal Pradesh and Uttarakhand in association with WD over the Area.

**Westerly Trough:**

Trough in westerlies runs roughly along 74.0°E north of lat 26.0°N

**Cloud Description:**

Scattered low/medium clouds with embedded moderate to intense convection were seen over Bihar adjoining NE Jharkhand, extreme E Assam and adjoining Nagaland. Isolated low/medium clouds with embedded moderate to intense convection were seen over extreme E Uttar Pradesh. Scattered low/medium clouds with embedded isolated weak to moderate convection were seen over S Haryana adjoining Uttar Pradesh, E Rajasthan, NE Tamilnadu, and Bay Islands. Scattered low/medium clouds were seen over rest Haryana, Delhi, Chhattisgarh, Odisha, Jharkhand, Sikkim, Madhya Pradesh, Maharashtra, and rest parts of South India.

**Arabian Sea:**

Scattered low/medium clouds with embedded moderate to intense convection were seen over South Arabian Sea.

**Bay of Bengal & Andaman Sea:**

Scattered low/medium clouds with embedded moderate to intense convection were seen over S Bay of Bengal, Andaman Sea and Gulf of Martaban.

**Past Weather:****Convection:-**

Moderate to Intense convection was observed over J&K Himachal Pradesh Punjab Rajasthan Haryana Delhi Uttarakhand Uttar Pradesh East Bihar Jharkhand West Bengal North East States Andhra Pradesh South Interior Karnataka Kerala Tamilnadu .

**OLR:-**

Upto **200**  $\text{wm}^{-2}$  was observed over East J&K South Interior Karnataka Kerala Tamilnadu.

Upto **230**  $\text{wm}^{-2}$  was observed over Rest J&K Himachal Pradesh North Uttarakhand North West Uttar Pradesh Sikkim West Assam East Meghalaya West Gangetic West Bengal South Andhra Pradesh.

Upto **250**  $\text{wm}^{-2}$  was observed over Haryana Arunachal Pradesh Rest Assam West Meghalaya

**Westerly Trough & Jet-Stream:**

Trough in Westerlies runs roughly along Longitude 77.0E north of Latitude 25.0N.

No Jet Stream is observed over India.

**Dynamic Features:**

Low to Medium wind shear is observed over India.

Negative shear tendency is observed over Saurashtra and Positive shear tendency is observed over rest parts of India

A positive Vorticity field is observed over Saurashtra South Chhattisgarh Andhra Pradesh Odisha West Bengal .

Positive low level convergence is observed over Saurashtra South Chhattisgarh Andhra Pradesh Odisha West Bengal and Negative low level convergence observed over rest parts of India

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

Rainfall Up to **70** mm was observed over Sub Himalayan West Bengal adjoining East Assam North West Tamilnadu. Rainfall Up to **50** mm was observed over West Gangetic West Bengal adjoining Jharkhand South Interior Karnataka Kerala Rest Tamilnadu. Rainfall Up to **30** mm was observed over South West & Central Odisha. Rainfall Up to **10** mm was observed over J&K Himachal Pradesh North-West Uttar Pradesh North Haryana Rest Assam Nagaland.

**HEM:.**

Rainfall Up to **70** mm was observed over South Interior Karnataka Kerala North West Tamilnadu. Rainfall Up to **14** mm was observed over West J&K Himachal Pradesh West Uttarakhand South West & Central Odisha Sub Himalayan West Bengal Meghalaya.

Rainfall Up to **07** mm was observed over North Haryana West Gangetic West Bengal East Assam Nagaland Rest Tamilnadu North Interior South Andhra Pradesh

### **RADAR and RAPID Observation:**

DWR Composite at 1650hrs IST indicated strong convection over E & NE Jharkhand adjoining West Bengal. It also indicated significant convection over Coastal Andhra Pradesh, Rayalaseema, Telangana, Maharashtra, Odisha, Bihar, Uttarakhand, HP and E Rajasthan adjoining N Madhya Pradesh. Squall line echo (max dBZ 55-60 and height >15km) was seen in DWR Kolkata at 1121UTC (1651hrs IST). RAPID RGB Satellite imagery at 1600hrs IST indicated significant convective clouds over Bihar, Jharkhand, Odisha, coastal Andhra Pradesh, Rayalaseema, Telangana, Maharashtra, Karnataka, J & K, Himachal Pradesh, Uttarakhand, E Rajasthan adjoining extreme N Madhya Pradesh, W Madhya Pradesh, Nagaland and Nicobar Islands.

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

Higher Dust concentration was observed over north-west Africa. Dust concentration is expected to increase over north-west India for next five days. High PM10 concentration was observed over Rajasthan and is expected to increase over north India in next five days.

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

### **NCMRWF (NCUM Forecasts based on 00 UTC of the day):-**

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

**12UTC Charts of Day 0-4** show evolution of heat low over NW India and adjoining Pakistan with MSLP values lower than 992hPa on Day-2 to Day-4.

**12UTC charts on days from Day0-4:** show a zones of wind discontinuity at 925 hPa :(i) SW-NE extending from NIK-Maharashtra region to Jharkhand and WB region.

**A CYCIR is seen over Arabian Sea:** from Day-2 to Day-4 moving westwards. At 15N/56E on day-4 00UTC

**A CYCIR is seen over Bay fo Bengal:** from Day-2 to Day-4 moving northwards. At 15N/90E on Day-5 00UTC

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

Weaker core winds at 12 UTC on all days over India

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

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

Day0: Jharkhand, Odisha,

Day1: Assam Meghalaya, Jharkhand, Bihar, Odisha, Chhattisgarh, Telangana,

Day2: Assam Meghalaya, Jharkhand, Madhya Maharashtra, Chhattisgarh, TN Puducherry, NI Karnataka,

Day3: Jharkhand, Punjab, West MP, Chhattisgarh, NI Karnataka,

Day4: Hry Chd Delhi, Vidarbha, TN Puducherry

#### **4. Low level Vorticity:-Positive Vorticity (> $15 \times 10^{-5}$ /s):**

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

Day0: Arunachal Pradesh, Assam Meghalaya, Jharkhand,

Day1: Arunachal Pradesh, Assam Meghalaya, Telangana, TN Puducherry,

Day2: Arunachal Pradesh, Assam Meghalaya, Jharkhand, Saurashtra Kutch, TN Puducherry,

Day3: Arunachal Pradesh, Assam Meghalaya, Jharkhand, Uttarakhand, Himachal Pradesh, Chhattisgarh, TN Puducherry,

Day4: Assam Meghalaya, Bihar, East UP, West UP, Uttarakhand, Himachal Pradesh, TN Puducherry, Kerala

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

**(Day/Index : Subdivisions with Showalter Index < -4):**

Day0: Arunachal Pradesh, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, Uttarakhand, Himachal Pradesh, Jammu Kashmir, West RJ, Odisha, Konkan Goa, Madhya Maharashtra, Coastal AP, TN Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day1: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Bihar, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Konkan Goa, Madhya Maharashtra, Chhattisgarh, Coastal AP, Telangana, Rayalaseema, TN Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day2: Arunachal Pradesh, Sub Himalayan WB, Bihar, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Saurashtra Kutch, Konkan Goa, Madhya Maharashtra, Coastal AP, Telangana, Rayalaseema, TN Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day3: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Jharkhand, Bihar, East UP, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Konkan Goa, Chhattisgarh, Coastal AP, Telangana, TN Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day4: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Himachal Pradesh, Jammu Kashmir, West RJ, Odisha, Konkan Goa, Chhattisgarh, Coastal AP, Telangana, TN Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala

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

**(Day/Index : Subdivisions with K Index > 40):**

Day0: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, Uttarakhand, Hry Chd Delhi, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, Konkan Goa, Madhya Maharashtra, Chhattisgarh, Coastal AP, Telangana, Rayalaseema, TN Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka,

Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Hry Chd Delhi, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, Konkan Goa, Madhya Maharashtra, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalaseema, TN Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, Uttarakhand, Himachal Pradesh, Jammu Kashmir, West RJ, Odisha, Madhya Maharashtra, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalaseema, TN Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalaseema, TN Puducherry, Coastal Karnataka, SI Karnataka,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Chhattisgarh, Coastal AP, Telangana, Rayalaseema, TN Puducherry, NI Karnataka, SI Karnataka

**7. Spatial distribution of TTI (TTI >50 [Scattered Thunderstorms few severe]):**

**(Day/Index : Subdivision with Total Totals Index > 52):**

Day0: Arunachal Pradesh, Sub Himalayan WB, Bihar, East UP, Uttarakhand, Himachal Pradesh, Jammu Kashmir, West RJ, Odisha, Konkan Goa, Madhya Maharashtra, Coastal AP, Coastal Karnataka,

Day1: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Himachal Pradesh, Jammu Kashmir, West RJ, Konkan Goa, Madhya Maharashtra, Rayalaseema, TN Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka,

Day2: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Saurashtra Kutch, Konkan Goa, Madhya Maharashtra, Rayalaseema, TN Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka,

Day3: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, Vidarbha, Chhattisgarh, Coastal AP, Telangana, TN Puducherry,

Day4: Arunachal Pradesh, Sub Himalayan WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Himachal Pradesh, Jammu Kashmir, West RJ, Odisha, Chhattisgarh, Coastal AP, Telangana, TN Puducherry, SI Karnataka

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

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

Day1: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Uttarakhand, Himachal Pradesh,

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Jammu Kashmir, Kerala,

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

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Andaman Nicobar, Kerala,

Day5: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Bihar, Uttarakhand, Andaman Nicobar, Kerala

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

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

00 UTC analysis shows an east west trough over UP, Bihar, Jharkhand and adjoining areas. The analysis also shows a trough at low level from this system passing through Odisha and North Andhra and extending up to TN. The N-S oriented trough from west UP and Bihar along north Odisha and thereby extending up to interior parts of Tamil Nadu is seen persisting during next 4 to 5 days

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

No presence of jet core over the Indian region for the next 5 days.

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

Analysis shows low level positive vorticity (>12 x 10<sup>-5</sup>/s) mainly over Interior Odisha, and Chhattisgarh regions. The high vorticity belts are mainly confined over regions of Odisha, Chhattisgarh region along with few pockets in AP and Karnataka during next 3 days.

#### **4. Spatial distribution of T-Storm Initiation Index, Lifted Index, Total Total Index, CAPE, CINE and Sweat Index (High potential for thunderstorm):**

**T-Storm Initiation Index (> 4):** Significant threshold values are noticed over GWB, Odisha, and over major regions bordering the east coast and also few regions in Gujarat in the analysis. Forecast shows high threshold values over west coast of India mainly over the Gujarat and Maharashtra coast and regions over Odisha, GWB, coastal AP and TN for the next 3 days.

**Lifted Index (< -2):** The areas with index less than -2 lies along east UP, Bihar, Chhattisgarh, GWB and major regions of AP and TN along with major regions along the west coast for the next 3 days.

**Sweat Index (> 400):** 00UTC shows significant values over major parts over Bihar, GWB, Odisha, Coastal AP, TN and over major regions bordering the west coast of the country and is expected to persist for the next 3 days.

**CAPE (> 1000):** Mostly along east coast of India, Bihar, GWB, Odisha, and AP and along major regions bordering the west coast during the next 3 days.

**CIN (50-150):** Maximum CIN values are found in areas over GWB, Odisha, AP and TN along with major pockets in the Gujarat region for the next 2-3 days.

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

10-40 mm rainfall is forecasted tomorrow over isolated pockets in the north east states and in the Kerala region along with WB region and is expected to persist for the next 5 days.

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

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

15-40 dBZ over isolated pockets of the south peninsular and in the north eastern region today

15-40 dbz over major parts of the north eastern states in the early morning hours of tomorrow

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

**CAPE (> 1000):** Mostly along GWB, Odisha, AP and TN and along major regions bordering the west coast during next 3 days.

**CIN (50-150):** Higher values over most regions of India except over central India, NW India, J & K region and NE states during next three days.

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

10-40 mm over isolated pockets in the north eastern region and it is expected to persist for the next 3 days.

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

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

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

A shear zone runs roughly along altitude 10.0°N at 3.1 km above mean sea level. Together with the embedded vortices, this feature will cause thunderstorm with gusty winds to develop over Kerala, Interior Tamil Nadu, Coastal and South Interior Karnataka on day 1 and day 2. Heavy rain is likely over Kerala on day1 and day2 in association with these systems. The heavy rainfall belt will extend to South Interior Karnataka on day 2.

The Western Disturbance as an upper air cyclonic circulation over Jammu & Kashmir and adjoining Pakistan now lies over Jammu & Kashmir & neighbourhood between 3.6 km & 5.8 km, with a trough aloft runs roughly along Long. 74.0° E and north of Lat. 30.0° N. In association with the movement of the system towards north-east, thundersquall with hail is expected over Uttarakhand on day1 and thundersquall over Himachal Pradesh on day 1 and day 2. Uttarakhand will experience thunderstorm with on day 2 also, but of lesser severity.

The induced upper air cyclonic circulation over Punjab & neighbourhood between 1.5 and 2.1 Km above mean sea level persists. Also, the upper air cyclonic circulation over southwest Rajasthan & adjoining south Pakistan extending upto 2.1 Km above mean sea level persists. However, the upper level features are not supporting for the development of severe weather over the regions in the next 48 hours.

The upper air cyclonic circulation over north Chhattisgarh & neighbourhood extending upto 0.9 km above mean sea level is persisting over the same region today. The trough from this system to north coastal Andhra Pradesh across interior Odisha extending upto 0.9 Km above mean sea level is also persisting. The upper level divergence to the east of the system is favourable for development thundersquall over Gangetic West Bengal, Jharkhand, Bihar and Orissa on day1. The thunderstorms will develop over the region on day 2 also, however, they will be associated only with gusty winds.

The low level convergence of the moist air over north eastern states is expected to cause thundersquall over Assam& Meghalaya on day1 and over Assam& Meghalaya and NMMT on day2.

**24 hour Advisory for IOP:**

Himachal Pradesh, Uttarakhand, East Rajasthan  
Kerala, South Interior Karnataka, Coastal Karnataka, Interior Tamilnadu, North Coastal Andhra Pradesh  
Orissa, Bihar and Jharkhand  
Sub Himalayan West Bengal, Gangetic West Bengal, Assam & Meghalaya

**48 hour Advisory for IOP:**

Himachal Pradesh, Uttarakhand,  
Kerala, South Interior Karnataka, Coastal Karnataka, Interior Tamilnadu  
Jharkhand, Orissa  
Sub Himalayan West Bengal, Himachal Pradesh, Assam& Meghalaya, NMMT

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 RAPID tool:

<http://rapid.imd.gov.in/>

Low Level Winds

[http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/LLW/MAR\\_2017/?C=M;O=D](http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/LLW/MAR_2017/?C=M;O=D)

Upper level winds

[http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/HLW/MAR\\_2017/?C=M;O=D](http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/HLW/MAR_2017/?C=M;O=D)

Past24hourHEMandIMRrainfall(upto03UTCoftoday)

IMR: [http://satellite.imd.gov.in/img/3Ddaily\\_imr.jpg](http://satellite.imd.gov.in/img/3Ddaily_imr.jpg)

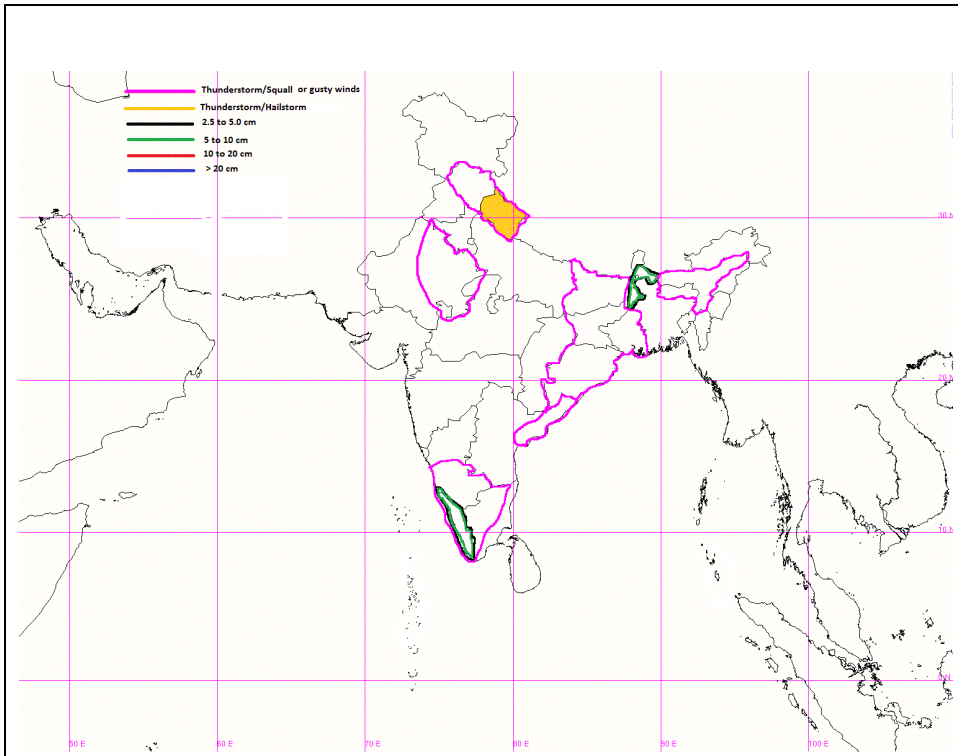
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ForRadarimagesofthepast24hoursincludingmosaicofimages:

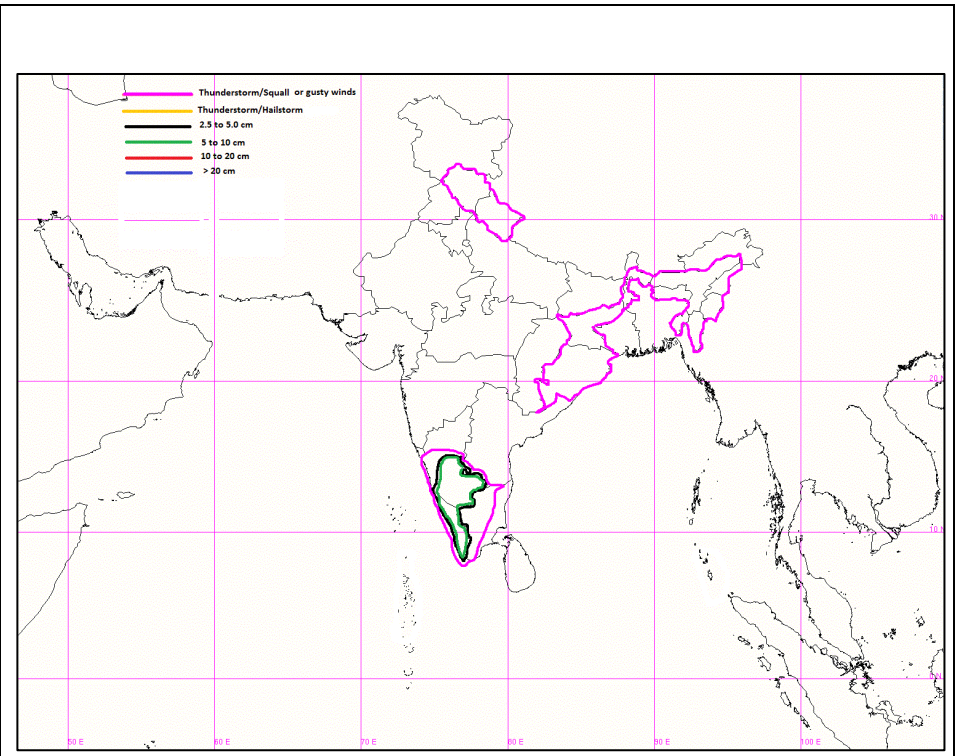
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Satellite sounder based T- Phigram

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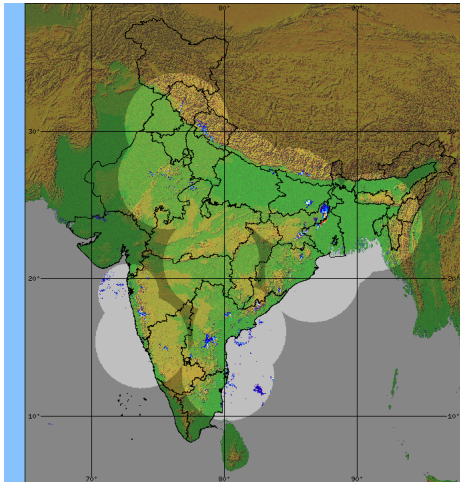


**IOP Advisory for 24 hours**

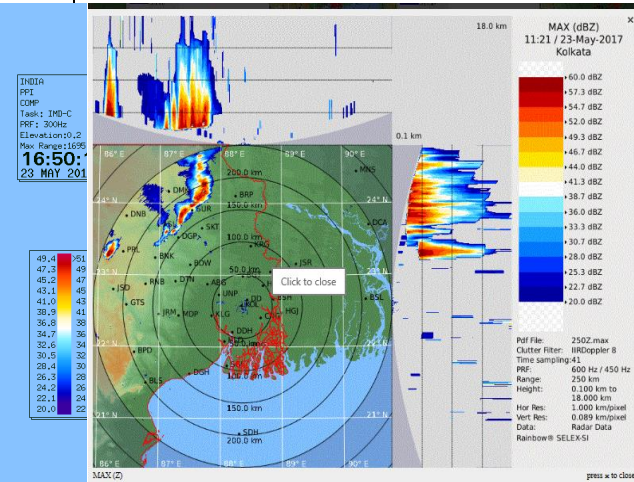


**IOP Advisory for 48 hours**

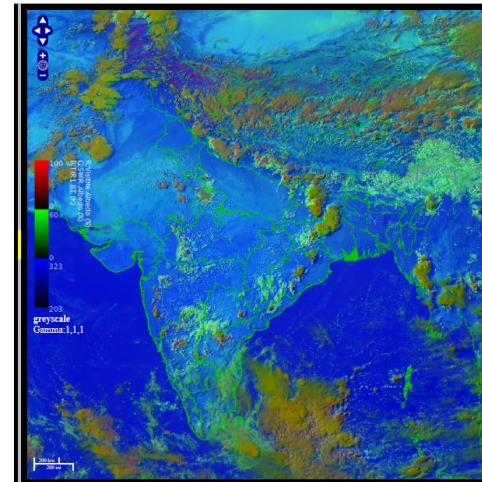




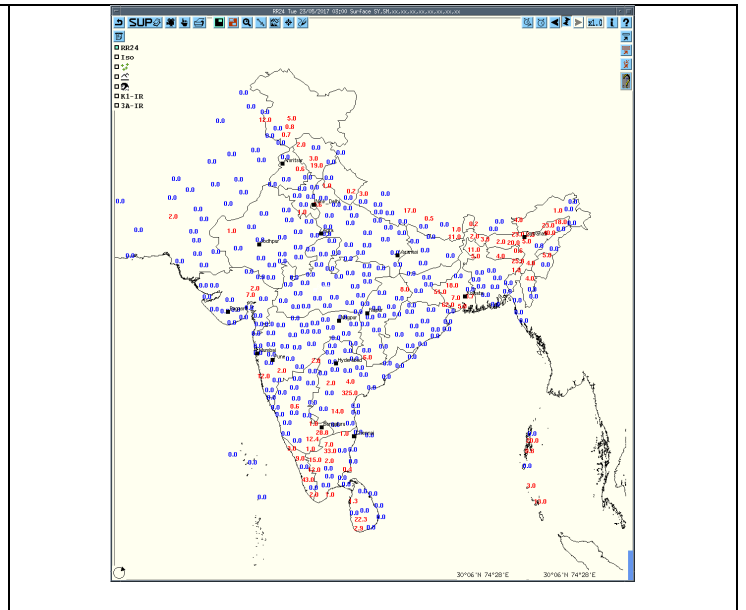
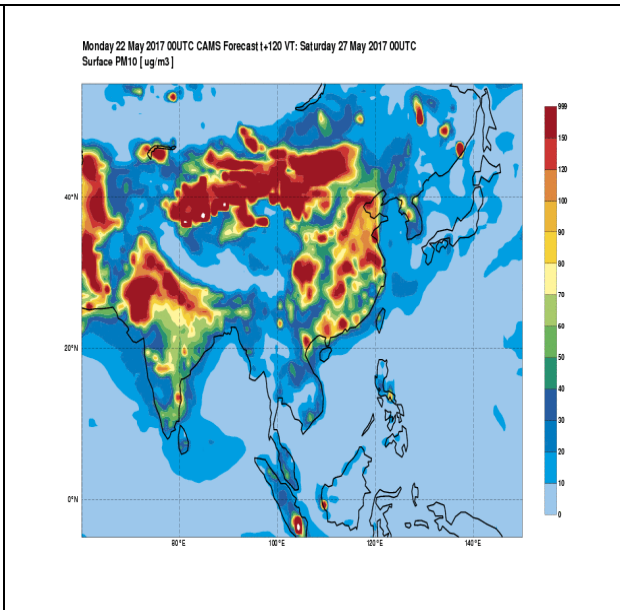
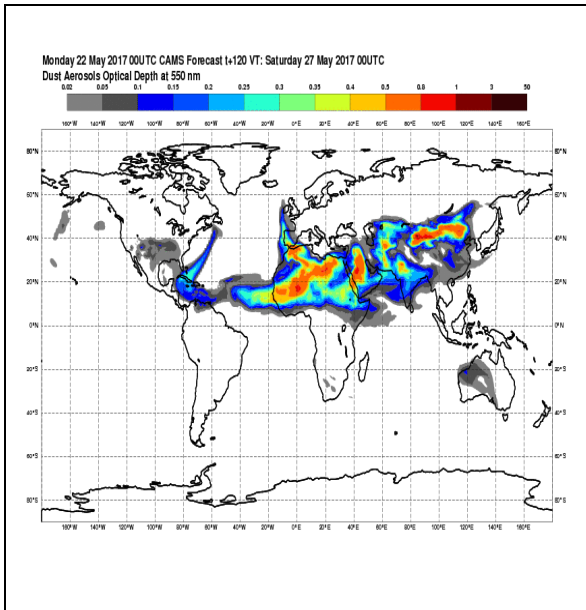
**DWR Composite at 1650 hrs IST**



**DWR Kolkata max(dBZ) at 1121UTC (1651hrs IST)**



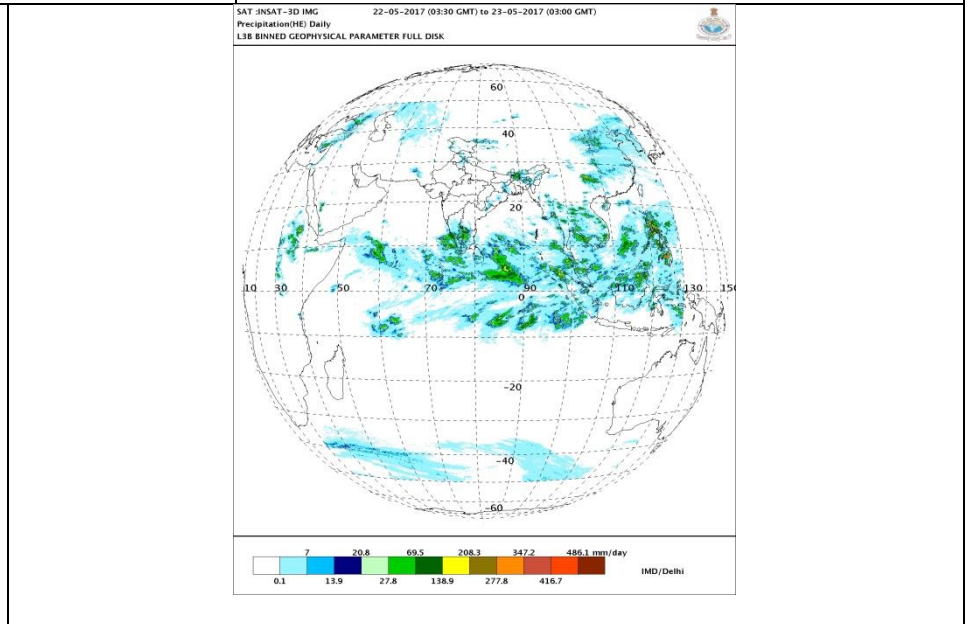
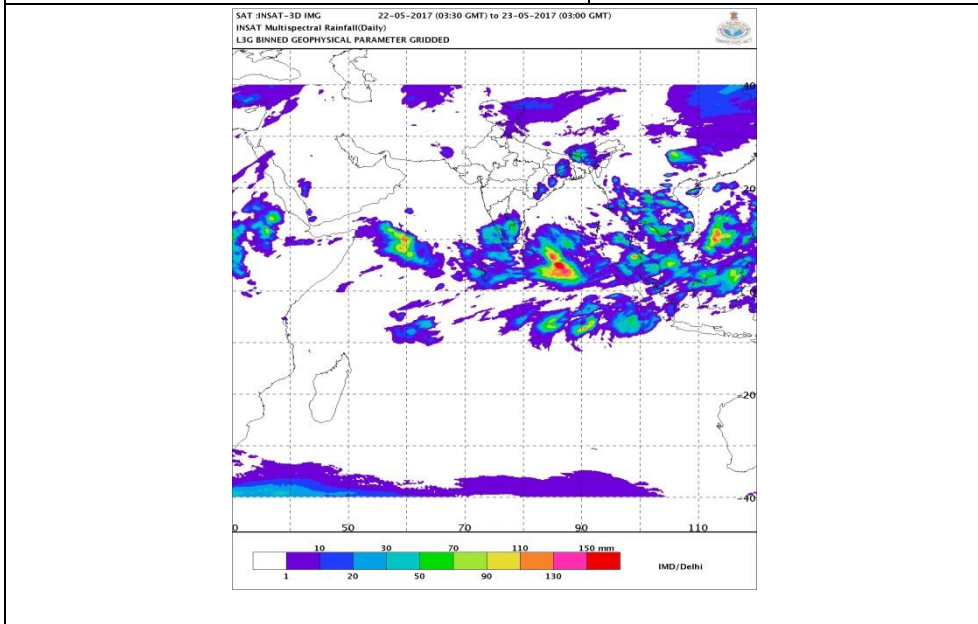
**RAPID RGB Satellite Imagery at 1600 hrs IST of today**



**Forecast Dust Concentration for 00UTC of 27<sup>th</sup> May**

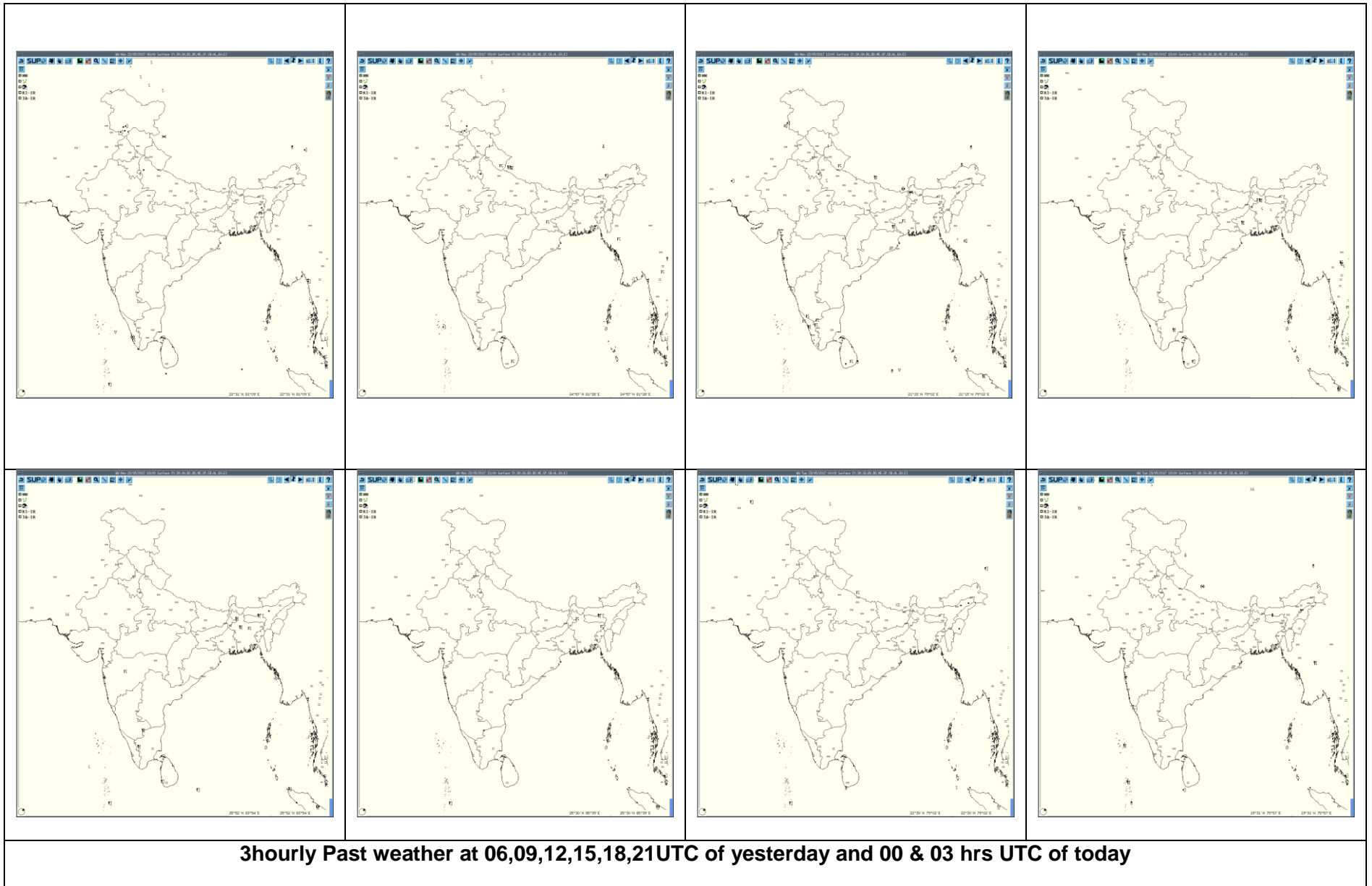
**PM10 Forecast for 00UTC of 27<sup>th</sup> May**

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

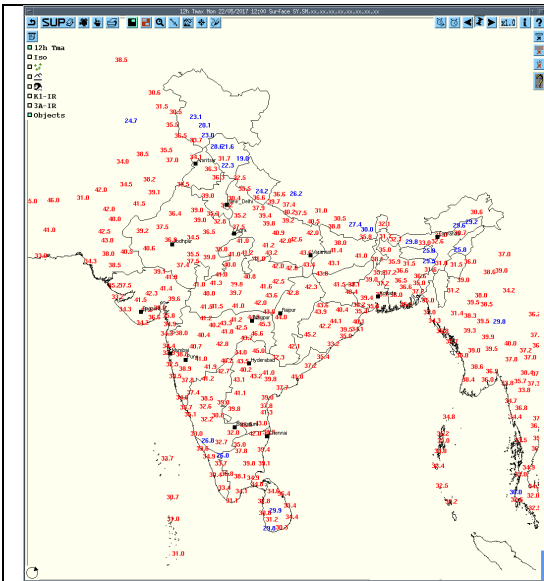


**IMR Rainfall**

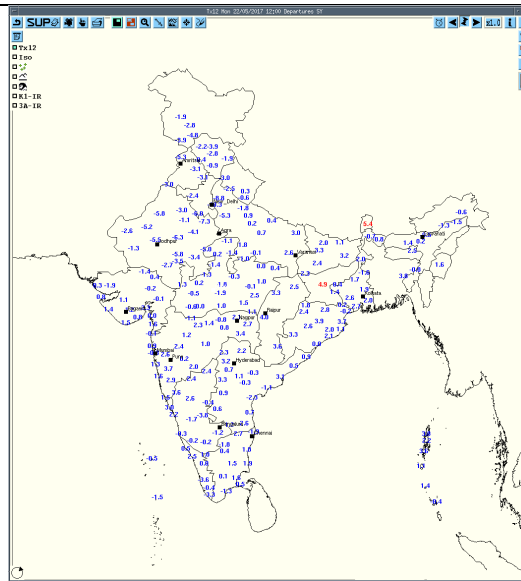
**HEM Rainfall**



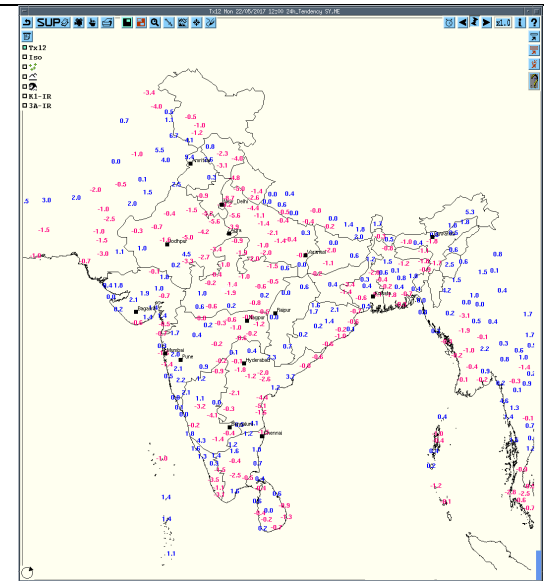
**3hourly Past weather at 06,09,12,15,18,21UTC of yesterday and 00 & 03 hrs UTC of today**



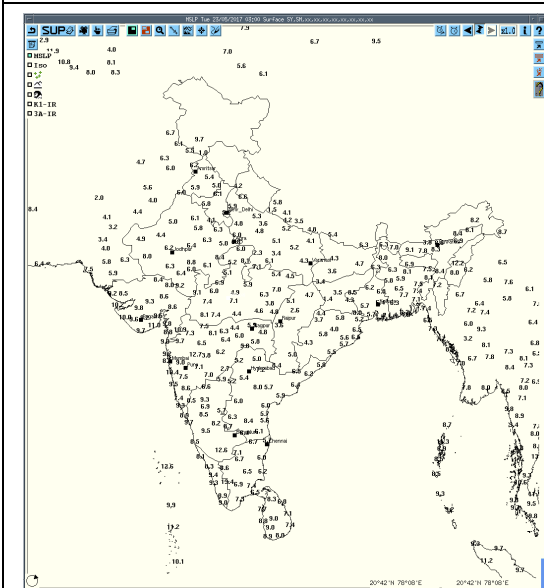
Tmax



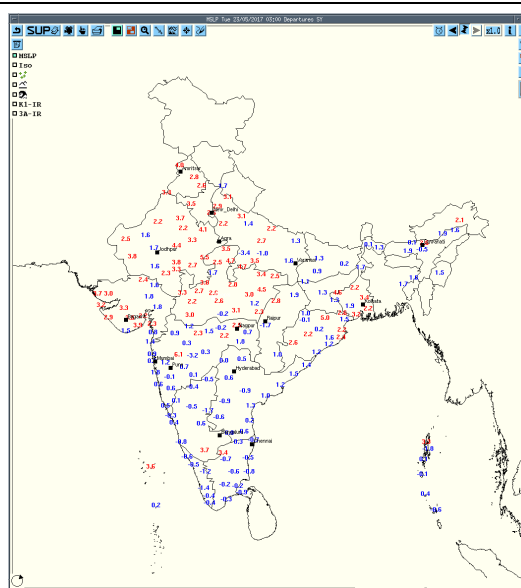
Departure Tmax



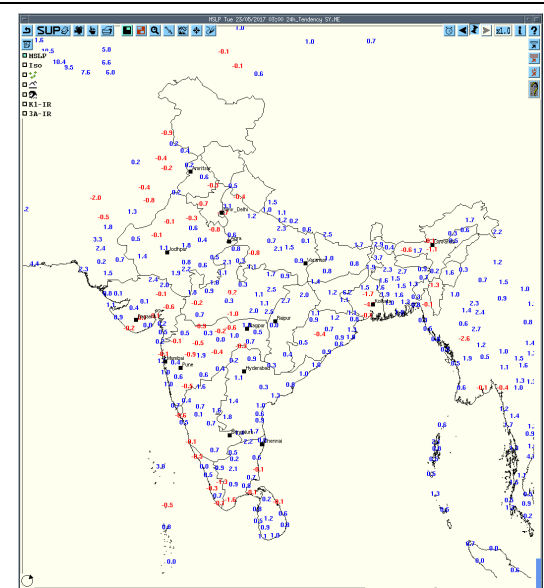
Tendency Tmax



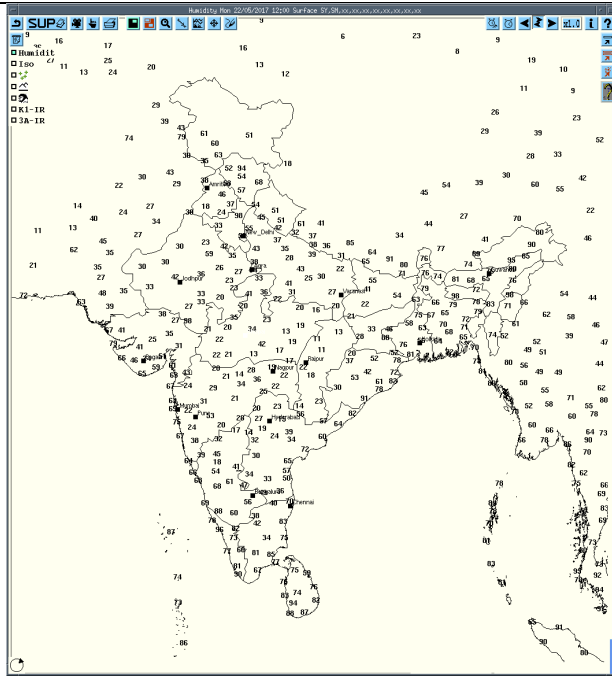
MSLP



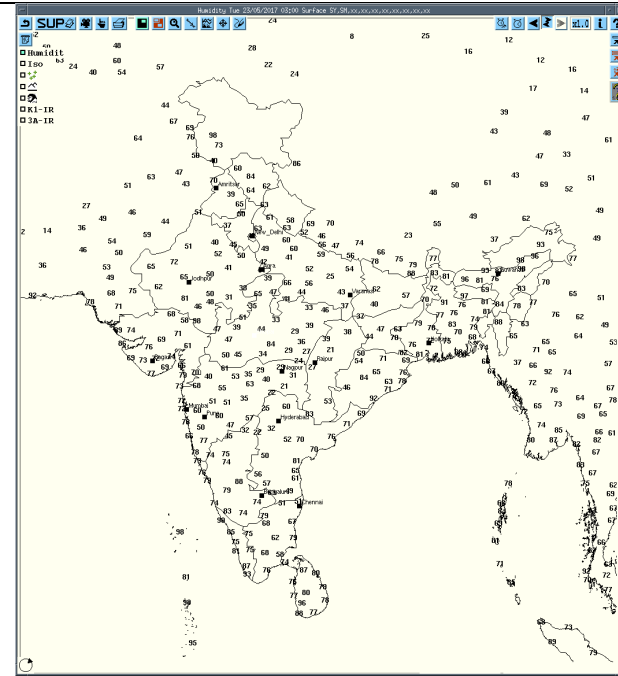
Departure MSLP



Tendency MSLP



RH at 12UTC yesterday



RH at 03UTC today

**Realised past 24hrs TS/SQ/HS Data (reported at 0300UTC of the day):**

| <b>Realized weather past 24hours (Based on SYNERGIE Products)</b> |                          |                                  |               |                           |                      |
|---|--------------------------|----------------------------------|---------------|---------------------------|----------------------|
| <b>Date</b>   | <b>Time of Reporting</b> | <b>Name of Station Reporting</b> | <b>Region</b> | <b>STATE</b>              | <b>Weather Event</b> |
| 21-05-17  | 0600UTC                  | Alappuzha                        | S India       | Kerala                    | Thunderstorm         |
| 22-05-17  | 0900UTC                  | Mukteshwar                       | NW India      | Uttarakhand               | Thunderstorm         |
|   |                          | Ranchi                           | E India       | Jharkhand                 | Thunderstorm         |
| 22-05-17  | 1200UTC                  | Mukteshwar                       | NW India      | Uttarakhand               | Thunderstorm         |
|   |                          | Jamshedpur                       | E India       | Jharkhand                 | Thunderstorm         |
|   |                          | Panagarh                         | E India       | West Bengal               | Thunderstorm         |
|   |                          | Madikeri, Chamarajanagar         | S India       | Karnataka                 | Thunderstorm         |
|   |                          | Kannur, Karipur, Kozhikode       | S India       | Kerala                    | Thunderstorm         |
|   |                          | Coonoor                          | S India       | Tamilnadu                 | Thunderstorm         |
| 22-05-17  | 1500UTC                  | Tiruchirappalli                  | S India       | Tamilnadu                 | Thunderstorm         |
|   |                          | Coimbatore                       | S India       | Tamilnadu                 | Lightening           |
|   |                          | Bengaluru                        | S India       | Karnataka                 | Lightening           |
|   |                          | Sundernagar                      | NW India      | Himachal Pradesh          | Thunderstorm         |
|   |                          | Bankura                          | E India       | West Bengal               | Thunderstorm         |
|   |                          | Malda                            | E India       | West Bengal               | Lightening           |
|   |                          | Ahmedabad                        | W India       | Gujarat                   | Lightening           |
| 22-05-17  | 1800UTC                  | Guwahati                         | NE India      | Assam                     | Thunderstorm         |
|   |                          | Malda                            | E India       | West Bengal               | Lightening           |
|   |                          | Aurangabad                       | W India       | Maharashtra               | Thunderstorm         |
|   |                          | Bengaluru (City & HAL)           | S India       | Karnataka                 | Thunderstorm         |
|   |                          | Coimbatore                       | S India       | Tamilnadu                 | Thunderstorm         |
| 22-05-17  | 2100UTC                  | Guwahati                         | NE India      | Assam                     | Thunderstorm         |
| 23-05-17  | 0000UTC                  | Aminidivi                        | S India       | Andaman & Nicobar Islands | Lightening           |
| 23-05-17  | 0300 UTC                 | Aminidivi                        | S India       | Andaman & Nicobar Islands | Thunderstorm         |

| Realized TS/HS/SQ during past 24 hours ending at 0300UTC of today (received from RMCs/MCs) |          |                             |   |                 |                            |                   |
|--|----------|-----------------------------|---|-----------------|----------------------------|-------------------|
| Name of Station Reporting  | Region   | STATE                       | Weather Event (TS/Hail/Squall)              | Date            | Time of Commencement (IST) | Time of end (IST) |
| Mukteshwar   | NW India | Uttarakhand                 | Thunderstorm                                | 22-05-17        | 1210<br>1715               | 1530<br>1800      |
| Sundernagar  | NW India | Himachal Pradesh            | Thunderstorm                                | 22-05-17        | 1835                       | 1935              |
| Ludhiana   | NW India | Punjab                      | Thunderstorm                                | 22-05-17        | 1520                       | 1610              |
| Pahalgam   | NW India | J & K                       | Thunderstorm                                | 22-05-17        | 1200                       | 1240              |
| Kukernag   | NW India | J & K                       | Thunderstorm                                | 22-05-17        | 1200                       | 1245              |
| Shimla   | NW India | Himachal Pradesh            | Thunderstorm                                | 22-05-17        | 2000                       | 2100              |
| Jaisalmer  | NW India | Rajasthan                   | Thunderstorm                                | 22-05-17        | 2050                       | 2145              |
| Ahmedabad  | W India  | Gujarat                     | Thunderstorm                                | 22-05-17        | 1735                       | 2100              |
|  |          |                             | <b>Hailstorm with diameter 1.0</b>          | <b>22-05-17</b> | <b>1822</b>                | <b>1830</b>       |
|  |          |                             | <b>Squall from SW with max speed112kmph</b> | <b>22-05-17</b> | <b>1822</b>                | <b>1823</b>       |
| Bhavnagar  | W India  | Gujarat                     | Thunderstorm                                | 22-05-17        | 1820                       | ---               |
| Tuni   | S India  | Andhra Pradesh(CAP)         | Thunderstorm                                | 22-05-17        | 1650                       | 1700              |
| Tirupati   | S India  | Andhra Pradesh(Royalaseema) | Thunderstorm                                | 22-05-17        | 1600                       | 1630              |
| Dhubri   | NE India | Assam                       | Thunderstorm                                | 22-05-17        | 0945                       | 1000              |
| Shillong   | NE India | Meghalaya                   | Thunderstorm                                | 22-05-17        | 1005                       | 1045              |
| Lengpui  | NE India | Mizoram                     | Thunderstorm                                | 22-05-17        | 1500                       | 1635              |
| Guwahati   | NE India | Assam                       | Thunderstorm                                | 22-05-17        | 2120                       | 2140              |
| Guwahati   | NE India | Assam                       | Thunderstorm                                | 22-05-17        | 2155                       | 2245              |
| Jorhat   | NE India | Assam                       | Thunderstorm                                | 23-05-17        | 0605                       | 0710              |
| Diamond Harbour  | E India  | West Bengal(GWB)            | Thunderstorm                                | 22-05-17        | 2100                       | 2140              |
| Haldia   | E India  | West Bengal(GWB)            | Thunderstorm                                | 22-05-17        | 2050                       | 2149              |
|  |          |                             | Lightening                                  | 22-05-17        | 2015                       | 2151              |
| Digha  | E India  | West Bengal(GWB)            | Lightening                                  | 22-05-17        | 2100                       | 2140              |
| Bankura  | E India  | West Bengal(GWB)            | Thunderstorm                                | 22-05-17        | 1800                       | 2035              |

|                  |         |                           |   |                 |             |             |
|------------------|---------|---------------------------|---|-----------------|-------------|-------------|
|                  |         |                           | <b>Squall from NW with max speed 67kmph</b> | <b>22-05-17</b> | <b>1825</b> | <b>1827</b> |
|                  |         |                           | Lightening                                  | 22-05-17        | 1755        | 1800        |
| Jamshedpur       | E India | Jharkhand                 | Thunderstorm                                | 22-05-17        | 1550        | 1830        |
| Ranchi           | E India | Jharkhand                 | Thunderstorm                                | 22-05-17        | 1425        | 1635        |
| Port Blair       | E India | Andaman & Nicobar Islands | Thunderstorm                                | 22-05-17        | 1615        | 1629        |
| Bengaluru City   | S India | Karnataka (SIK)           | Thunderstorm                                | 22/23-05-17     | 222210      | 230200      |
|                  |         |                           | <b>Squall from N with max speed 56kmph</b>  | <b>22-05-17</b> | <b>2145</b> | <b>2146</b> |
| Bengaluru (HAL)  | S India | Karnataka (SIK)           | Thunderstorm                                | 22/23-05-17     | 222210      | 230100      |
|                  |         |                           | <b>Squall from SE with max speed 57kmph</b> | <b>22-05-17</b> | <b>2200</b> | <b>2201</b> |
| Yelahanka IAF    | S India | Karnataka (SIK)           | 2200-0200                                   | 22/23-05-17     | 222200      | 230200      |
| Bengaluru (KIAL) | S India | Karnataka (SIK)           | 2153-0030                                   | 22/23-05-17     | 222153      | 230030      |
| Dharmapuri       | S India | Tamilnadu(North)          | Thunderstorm                                | 22-05-17        | 1700        | 2300        |
| Salem            | S India | Tamilnadu(North)          | Thunderstorm                                | 22-05-17        | 1810        | 1910        |
| Coimbatore       | S India | Tamilnadu(North)          | Thunderstorm                                | 22-05-17        | 2047        | 0050        |
| Yercaud          | S India | Tamilnadu(North)          | Thunderstorm                                | 22-05-17        | 1750        | 2100        |



## Past 24 hours DWR Report:

| Radar Station name | Date of Reporting | 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  |
|--------------------|-------------------|------------------------------------|--|--|---|--|---|
| Jaipur             | 23-05-17          | 230132-230302                      | Single cells with average height of 5.5 km maximum reflectivity 40 dBZ   | Single Cell develop 0132(23/05/17) to 0302 UTC towards North West of Jaipur and movement towards South East East at speed 45-50 km/hr. | Cell continuous forming from 0132 UTC North West of Jaipur and maximum relectivity during 0212UTC and died down at 0302 UTC                     |  | Churu   |
| Lucknow            | 23-05-17          | 220722-220822                      | Single cells with average height of 4.5 KM. Echo tops:4.0 KM with Maximum Reflectivity of 34 dBZ   | W(100KM) From LKN Radar and moving in NNE'ly direction at speed of 43 km/hr  | Single cell started forming at W(100KM) from LKN Radar at 0712 UTC did not intensified and dissipated at 0832 UTC at NW(80KM) from LKN Radar.   | -  | -   |
|                    |                   | 230102-230300                      | Single cells with average height of 5 KM. Echo tops:4.5 KM with Maximum Reflectivity of 36 dBZ   | WNW(70KM) From LKN Radar and moving in NNE'ly direction at speed of 22 km/hr   | Single cell started forming at WNW(75KM) from LKN Radar at 0052 UTC did not intensified and dissipated at 0300 UTC at NNW(80KM) from LKN Radar. | -  | -   |
| Nagpur             | 23-05-17          | 220932-230152                      | Multiple coming from SW  | 250 km in SW-dir moving E-ly   | Max Z=45 ht of cloud=2.5-5.8km  | Thunderstorm warning started at 1152 till 1222 in sw-dir 150 km away from Radar. | Isolated places of Distt. Yeotmal, Pusad, Hingoli, Chandrapur and Adilabad. |
|                    |                   | 230002-230252                      | Nil  |  |   |  |   |

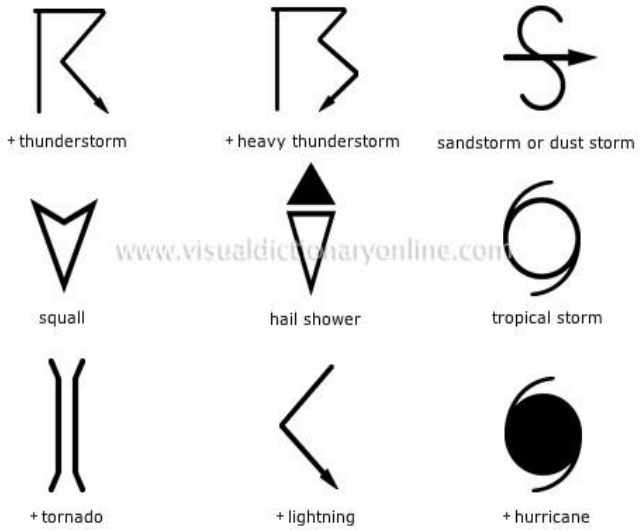
|         |          |                       |  |   |  |  |  |
|---------|----------|-----------------------|--|---|--|--|--|
| Patna   | 23-05-17 | 220300<br>-<br>221210 | NIL  | NIL   | NIL  | N/A  | N/A  |
|         |          | 221210<br>-<br>221310 | Single Cell.<br>Maximum Reflectivity<br>: 48.0<br>dBZ<br>Echo Top : 9 KM | Range: 56 km SOUTH<br>from DWR Patna<br>Movement- EASTERLY        | Warning<br>E-mail and Fax sent to<br>State Disaster<br>management Authority<br>and Concern DMs | Thunderstorm<br>with Rain and<br>gusty wind. | JAHANABAD,<br>NALANDA AND<br>NAWADA                      |
|         |          | 221310<br>-<br>230300 | NIL  | NIL   | NIL  | N/A  | N/A  |
| Patiala | 23-05-17 | 220300-<br>220600     | NO SIGNIFICANT<br>ECHO   | -----,  | -----  | -----  | -----  |
|         |          | 220600-<br>220900     | NO SIGNIFICANT<br>ECHO   | -----,  | -----  | -----  | -----  |
|         |          | 220900-<br>221200     | Multiple cells<br>Max= 59.0 dBz<br>Ht.= 09-14 km                         | Formation in NE AND<br>NORTH sector.<br>MOVEMENT NORTH-<br>WARDS. | -----  | TS/RA  | LUDHIANA,PHILL<br>OUR,<br>NAWANSHAR,NA<br>NGAL, HAMIRPUR |
|         |          | 221200-<br>221500     | Single cells<br>Max= 50.5 dBz<br>Ht.= 08 - 09 km                         | Formation in SSE<br>sector.<br>MOVEMENT SE-<br>WARDS.             | -----  | TS/RA  | HISAR  |
|         |          | 221500-<br>221800     | NO SIGNIFICANT   | -----   | -----  | -----  |  |
|         |          | 221800-<br>222100     | NO SIGNIFICANT<br>ECHO   | -----   | -----  | -----  | -----  |
|         |          | 222100-<br>230300     | NO SIGNIFICANT<br>ECHO   | -----   | -----  | -----  | -  |
|         |          | 230000-<br>230252     | NO SIGNIFICANT<br>ECHO   | -----   | -----  | -----  | -  |

|               |          |                 |  |   |   |  |   |
|---------------|----------|-----------------|--|---|---|--|---|
| Srinagar      | 23-05-17 | 220300-230300   | <p>1. Isolated single cell developed at 0320 utc with max. reflectivity 45-50 dbz and average height 6Km</p> <p>2. Multiple cell developed in SW- direction at 0850 utc with max. reflectivity 55-60 dbz and average height 6km. and afterwards transformed into all direction with max. reflectivity 40-45 dbz and average height 6km</p> | <p>1. Stationary Single cell developed at S- direction and dissipated at 0500 utc</p> <p>2. Multiple cells developed in SW direction and transformed into all direction till 0300 utc</p> | -----   | Thunderstorm reported Pahalgam;Kukernag                              | ALL DISTRICT AFFECTED WITH LIGHT RAIN     |
| Machilipatnam | 23-05-17 | 220851-221211   | Multiple cells average height of 11 km with maximum reflectivity of 66 dBZ   | NE (244km) and moving SW ly direction and dissipating at NE (165km) with average speed of 13 kmph   | Cell started forming at 0851UTC, at NE (244km) from Radar the maximum reflectivity during 0851 to 1201 UTC and died down at 1211UTC | Possibility of Thunder storm with Hail and rain with moderate winds. | Visakhapatnam and East Godavari Districts |
|               |          | 220821-220901   | Isolated single cell average height of 9 km with maximum reflectivity of 50.5 dBZ  | W (237km) stationary  | Cell started forming at 0821UTC, at W (237km) from Radar the maximum reflectivity during 0821 to 0851 UTC and died down at 0901UTC  | Possibility of Thunder storm and rain with light winds               | Kurnool District                          |
| Agartala      | 23-05-17 | 220300 - 220910 | Multiple cells formed one after another with Maximum Height 15 km and maximum reflectivity 52 dBZ at 0630UTC,formed two distinct squall line 40KM apart over Assam   | Formed 350 km NW of DWR and moved SE-wards at around 45 kmph  | Cells dissipated at 0910 UTC over E Assam   | N/A  | N/A                                       |

|          |                       |  |  |  |   |  |
|----------|-----------------------|--|--|--|---|--|
|          | 220300<br>-<br>220500 | Multiple cells with Maximum Height 10 km and maximum reflectivity 43 dBZ   | Formed 220 km NW of DWR and moved SE-wards at around 20 kmph   | Cells dissipated at 0500 UTC over Mizoram  | N/A                                     | N/A  |
|          | 220440<br>-<br>221140 | Multiple cells with Maximum Height 15 km and maximum reflectivity 55 dBZ at 0610UTC  | Formed 100 km NW of DWR and moved SE-wards at around 15 kmph   | Cells dissipated at 1140 UTC over Mizoram  | TS with rain at                         | Mamit dist of Mizoram, Dhalai & North dist. Of Tripura |
|          | 221140<br>-<br>222310 | Multiple cells formed one after another with Maximum Height 15 km and maximum reflectivity 51 dBZ formed squall line at 1540UTC  | Formed 360 km NW of DWR and moved SE-wards at around 50 kmph   | Cells dissipated at 2310 UTC over E-Assam  | N/A                                     | N/A  |
|          | 221300<br>-<br>221800 | Multiple cells with Maximum Height 12 km and maximum reflectivity 44 dBZ at 1540UTC  | Formed 460 km NW of DWR and moved SE-wards at around 15 kmph   | Cells dissipated at 1800 UTC over Balurghat of WB  | N/A                                     | N/A  |
| Paradeep | 220300-<br>221200     | Isolated single cells seen developing in the NW sector of Radar with av. Height of 9 kms and maximum height exceeding 14 kms, average reflectivity value of 30 dBZ and highest reflectivity value of 53 dBZ. | Formed in the NW sector of RADAR in the range of 265-300 degrees and at distance of 200 kms. Direction of movement is Ely.             | Cells merging in later stages to form a weak squall line kind of structure but are not properly connected. | TS with Rain. Hailstorms also expected. | Nayagarh, Cuttack, Khorda, Dhenkanal and Puri.         |
|          | 221200-<br>222200     | Isolated single cells seen developing in the W sector of Radar with av. Height of 7 kms and maximum height of 12 kms, average reflectivity value of 30 dBZ and highest reflectivity value of 44 dBZ.         | Formed in the N-NW sector of RADAR in the range of 335-5 degrees (CLOCKWISE) and at distance of 200 kms. Direction of movement is Ely. |  | TS                                      | Mayurbhanj, Keonjhar, Bhadrak and Baleshwar.           |

|         |          |               |   |   |  |                                      |                             |
|---------|----------|---------------|---|---|--|--------------------------------------|-----------------------------|
| Bhuj    | 23-05-17 | 220130-221230 | Isolated two cell<br>(1) 3 Km to 15 Km Ht. with 56 dBz Max.Z<br>(2) 3 Km to 10 Km Ht. with 53 dBz Max.Z   | (1) 175 KM SE move towards SE.<br>(2) 190 KM E move towards E.                            | -  | TS or TSRA                           | (1) Rajkot<br>(2) Ahmedabad |
| Kolkata | 23-05-17 | 220301-220731 | NIL   | NIL   | NO ECHO  | NIL                                  | NIL                         |
|         |          | 220741-220801 | NIL   | NIL   | NO ECHO  | NIL                                  | NIL                         |
|         |          | 220811-221131 | Multiple cells from cell at a position 24.016N / 86.622 E/ 312.6 Degree /239 km to 24.145N / 86.897 E/ 319.9 Degree /229.7 km away from Radar with maximum reflectivity of 58.0 dBz at 0941 UTC and maximum height of 11.56 Km at 0941UTC                               | NW (229.7 km to 239Km) to moving in ESE-ly direction at a speed of 24 kmph                | Multiple cells formed in NW at a distance of 229.7 km to 239km km from Radar at 0811 UTC . Matured, dissipated in NNW at 1131 UTC at a distance of 162.0 km from radar             | Hailstorm/Thunderstorm / Rain        | N/A                         |
|         |          | 221001-221841 | ii) Multiple cells from a position 22.801 N/ 85.973 E/ 276.5 Degree/ 245.5 km to 23.307 N/ 86.072 E/ 289.8 Degree/ 247.5 km away from radar and transformed into big cells with maximum reflectivity of 68.5 dBz at 1051 UTC and maximum height of 19.38 Km at 1041 UTC | ii. W (245.5 km) to WNW (247.5km) moving in ESE-ly/ SE-ly direction at a speed of 40 kmph | ii). Multiple cells formed in W to WNW at a distance of 245.5 km W to 247.5 KM WNW from Radar at 1021 UTC. Matured, dissipated in W at 1841 UTC at a distance of 9.3 km from radar | Hailstorm/Thunderstorm /Squall/ Rain | N/A                         |

|          |          |                   |     |     |             |     |     |
|----------|----------|-------------------|-----|-----|-------------|-----|-----|
|          |          | 221851-<br>222351 | NIL | NIL | NO ECHO     | NIL | NIL |
|          |          | 230001-<br>230301 | NIL | NIL | NO SIG ECHO | NIL | NIL |
| Karaikal | 23-05-17 | 220300-<br>230300 | --  | --  | DWR U/S     | --  | --  |



|                        |                    |
|------------------------|--------------------|
| ∞                      | haze               |
| ⌋                      | smoke              |
| ⌋→                     | dust or sand storm |
| ≡                      | fog                |
| ⚡                      | drizzle            |
| •                      | rain               |
| ✱                      | snow               |
| ▽                      | showers            |
| △                      | hail               |
| ⌋                      | thunderstorm       |
| <b>Weather Symbols</b> |                    |