



**India Meteorological Department**  
**FDP STORM Bulletin No.77 (21-05-2017)**

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

The Northern Limit of Monsoon (NLM) continues to pass through Lat.5.0°N/Long. 80.0° E, Lat. 8.0° N/Long. 87.0° E, Lat. 13.0 °N/ Long. 92.0° E and Lat. 16.0° N/ Long. 95.0° E.

An upper air cyclonic circulation is likely to develop over South East Bay of Bengal & neighbourhood during next 24 hours. With the development of upper air cyclonic circulation, conditions are likely to become favourable for further advance of southwest monsoon into some more parts of southwest, southeast and east central Bay of Bengal during subsequent 2-3 days.

A Western Disturbance as an upper air cyclonic circulation lies over north Pakistan & neighbourhood between 4.5 and 5.8 Km above mean sea level.

The upper air cyclonic circulation over Punjab & neighbourhood, now lies over northwest Uttar Pradesh & neighbourhood between 2.1 and 3.6 Km above mean sea level.

The upper air cyclonic circulation over southwest Rajasthan & neighbourhood, now lies over southwest Rajasthan & adjoining south Pakistan and extends upto 3.1 Km above mean sea level.

The upper air cyclonic circulation over central Uttar Pradesh & neighbourhood, now seen as a trough from west Bihar to north Chhattisgarh and extends upto 0.9 Km above mean sea level.

The upper air cyclonic circulation over south Chhattisgarh & adjoining Odisha extending upto 0.9 km above mean sea level persists. The trough from this system to south Coastal Andhra Pradesh, now runs from this system to Rayalaseema and extends upto 0.9 Km above mean sea level.

The trough in westerlies roughly along Long. 92.0° E and north of Lat. 23.0° N, now runs roughly along Long. 93.0° E and north of Lat. 23.0° N between 2.1 Km to 3.6 Km above mean sea level.

An upper air cyclonic circulation lies over Rayalaseema & neighbourhood at 1.5 Km above mean sea level.

The trough at mean sea level from south coastal Andhra Pradesh to Comorin area off Tamilnadu coast has become less marked.

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

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

**Convective Activity:**

| Cell No | Date/time (UTC) | Location/Area             | MIN CTT (- DEG C) | Movement | Remarks |
|---------|-----------------|---------------------------|-------------------|----------|---------|
| 5(old)  | 20/1300         | SHWBN ADJ BHUTAN          | 64                |          |         |
|         | 1400            | DO                        | 62                |          |         |
|         | 1500            | DO                        | 73                |          |         |
|         | 1600            | E SHWB ADJ ASSAM S BHUTAN | 80                |          |         |
|         | 1700            | DO                        | 79                |          |         |
|         | 1800            | DO                        | 77                |          |         |

|         |                            |    |
|---------|----------------------------|----|
| 1900    | DO                         | 67 |
| 2000    | DO                         | 58 |
| 2100    | DO                         | 61 |
| 2200    | MEGHA E ASSAM N MIZO N TRP | 63 |
| 2300    | DO                         | 63 |
| 21/0000 | DO                         | 64 |
| 0100    | N MIZO ADJ MANI            | 62 |
| 0200    | DO                         | 70 |
| 0300    | DO                         | 63 |

### Western Disturbance:

Scattered multi-layered clouds were seen over J & K, W Rajasthan, Punjab Haryana & Delhi in association with WD over the Area.

### Cloud Description:

Scattered low/medium clouds with embedded moderate to intense convection were seen over Mizoram, Lakshadweep & Bay Islands. Scattered low/medium clouds with embedded weak to moderate convection were seen over NW Rajasthan, adjoining Pakistan, South Interior Karnataka, Rayalaseema, Kerala and Tamilnadu. Scattered low/medium clouds with embedded isolated weak to moderate convection were seen over rest NE states. Scattered low/medium clouds were seen over SE Uttar Pradesh, Gujarat, E Madhya Pradesh, S Marathawada and rest parts of East & 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 intense to very intense convection were seen over S Bay of Bengal. Scattered low/medium clouds with embedded moderate to intense convection were seen over Andaman Sea.

### Past Weather:

#### Convection:-

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

#### OLR:-

Upto **200**  $\text{wm}^{-2}$  was observed over East J&K Kerala North West Tamilnadu adjoining South Interior Karnataka. Upto **230**  $\text{wm}^{-2}$  was observed over Rest J&K, Himachal Pradesh Uttarakhand North West Rajasthan South West Odisha adjoining North Andhra Pradesh South East Jharkhand South West Bengal adjoining Odisha Sub Himalayan West Bengal Sikkim Meghalaya Arunachal Pradesh Assam Nagaland South Interior Karnataka Rest Tamilnadu

#### Westerly Trough & Jet-Stream:

No Trough & Jet Stream observed over India.

#### Dynamic Features:

Low to Medium wind shear is observed over India.

Positive shear tendency is observed over the India.

A positive Vorticity field is observed over Saurashtra East Madhya Pradesh Chhattisgarh Odisha South Coastal Andhra Pradesh.

Negative low level convergence observed over Himachal Pradesh Maharashtra Bihar West Bengal and Positive low level convergence observed over rest parts of India

## **Precipitation:**

### **IMR:**

Rainfall Up to **50** mm was observed over Odisha adjoining West Bengal South Interior Karnataka North West Tamilnadu North Kerala. Rainfall Up to **20** mm was observed over South Kerala. Rainfall Up to **10** mm was observed over J&K Punjab West Haryana Uttarakhand North West Rajasthan North East States Rest Tamilnadu South Andhra Pradesh.

### **HEM:**

Rainfall Up to **70** mm was observed over Coastal Odisha South Interior Karnataka North West Tamilnadu North Kerala. Rainfall Up to **14** mm was observed over South West J&K Uttarakhand North East States. Rainfall Up to **07** mm was observed over Punjab West Haryana North West Rajasthan South Jharkhand South West Bengal Rest Rest Tamilnadu.

## **RADAR and RAPID Observation:**

DWR Patiala at 0812UTC indicated multiple echoes of moderate intensity (dBZ around 45-50 & height 10-12km).

Latest DWR composite not available

RAPID RGB Satellite imagery at 1300hrs IST indicated significant convective activity over J & K adjoining HP, adjoining Punjab and Lakshadweep & Minicoy Islands.

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

Dust concentration was observed over northern Africa and some parts of eastern Asia. Dust concentration is expected to increase over western and northern India for next five days.

High PM10 concentration was observed over north-western and northern India. PM10 concentration is expected decrease over northern India for 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 994hPa on Day-0,3 and 4.

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

**A CYCIR is seen over Arabian Sea:** from Day-0 to Day-4 moving westwards.

**Over SIKarnataka a CYCIR** at 925 hPa is seen near in Day-0 to Day-2 which is moving eastwards over Bay of Bengal in Day-3 and 4

#### **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 x 10<sup>-5</sup> /s):**

Day0: East UP, West RJ, West MP, Chhattisgarh,

Day1: Jharkhand, Chhattisgarh,

Day2: Arunachal Pradesh, Assam Meghalaya, Gangetic WB, Jharkhand, Madhya Maharashtra, Chhattisgarh, TN Puducherry, NI Karnataka,

Day3: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Hry Chd Delhi, Jammu Kashmir, Odisha, Saurashtra Kutch, Madhya Maharashtra, Coastal AP, TN Puducherry, NI Karnataka, SI Karnataka,

Day4: Assam Meghalaya, Bihar, East UP, West MP, East MP, Madhya Maharashtra, Vidarbha, Chhattisgarh, Rayalaseema, TN Puducherry, NI Karnataka, SI Karnataka

**4. Low level Vorticity:-Positive Vorticity (>15 x 10<sup>-5</sup>/s):**

**(Day/Index : Subdivisions with Lower Level Vortex > 15 x 10<sup>-5</sup> /s):**

Day0: Arunachal Pradesh, Assam Meghalaya, Uttarakhand, West RJ, TN Puducherry,

Day1: Arunachal Pradesh, Assam Meghalaya, Gangetic WB,

Day2: Arunachal Pradesh, Assam Meghalaya, Gangetic WB, Bihar, Saurashtra Kutch, TN Puducherry,

Day3: Arunachal Pradesh, Assam Meghalaya, Jharkhand, Bihar, Saurashtra Kutch, TN Puducherry, SI Karnataka, Kerala,

Day4: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Bihar, Saurashtra Kutch, TN Puducherry, NI Karnataka, Kerala

**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, Bihar, Uttarakhand, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, Guj Reg, Saurashtra Kutch, Konkan Goa, Coastal AP, Telangana, TN Puducherry, Coastal Karnataka, SI Karnataka, Kerala,

Day1: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Bihar, Uttarakhand, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, Guj Reg, Saurashtra Kutch, Konkan Goa, Madhya Maharashtra, Coastal AP, TN Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day2: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Jharkhand, 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,

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

Day4: Arunachal Pradesh, Sub Himalayan WB, Jharkhand, Bihar, East UP, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, East MP, Konkan Goa, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalaseema, TN Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka,

**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, Uttarakhand, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Odisha, West MP, Guj Reg, Saurashtra Kutch, Coastal AP, Telangana, Rayalaseema, TN Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

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

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

Day4: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, East MP, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalaseema, TN Puducherry, Coastal Karnataka, 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, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, Guj Reg, Saurashtra Kutch, Coastal AP, Telangana, SI Karnataka,

Day1: Arunachal Pradesh, Sub Himalayan WB, Bihar, West UP, Uttarakhand, Hry Chd Delhi, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, West MP, Guj Reg, Saurashtra Kutch, TN Puducherry,

Day2: Arunachal Pradesh, Sub Himalayan WB, Jharkhand, Bihar, Uttarakhand, Himachal Pradesh, Jammu Kashmir, West RJ, Odisha, Konkan Goa, Madhya Maharashtra, Chhattisgarh,

Day3: Arunachal Pradesh, Sub Himalayan WB, Jharkhand, Bihar, Uttarakhand, Hry Chd Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ, Odisha, Vidarbha, Chhattisgarh, Telangana, Rayalaseema, Coastal Karnataka, NI Karnataka, SI Karnataka,

Day4: Arunachal Pradesh, Sub Himalayan WB, Jharkhand, Bihar, East UP, Uttarakhand, Himachal Pradesh, Jammu Kashmir, West RJ, East RJ, West MP, East MP, Konkan Goa, Madhya Maharashtra, Marathawada, Vidarbha, Chhattisgarh, Telangana, NI Karnataka

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

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

Day1: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Andaman Nicobar,

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

Day3: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Jammu Kashmir, TN Puducherry, Kerala,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Jammu Kashmir, Rayalaseema, TN Puducherry, Coastal Karnataka, SI Karnataka, Kerala,

Day5: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Vidarbha, Chhattisgarh, Coastal AP, Rayalaseema, TN Puducherry, Coastal Karnataka, SI Karnataka, Kerala

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

**Not Received**

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

**Not Received**

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

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

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

Presently, an upper air cyclonic circulation is likely to develop over South East Bay of Bengal & neighbourhood during next 24 hours. With the development of upper air cyclonic circulation, conditions are likely to become favorable for further advance of southwest monsoon into some more parts of southwest, southeast and east central Bay of Bengal during subsequent 2-.3 days. Andaman and Nicobar Islands may experience the heavy rainfall activity on Day-1.

A Western Disturbance as an upper air cyclonic circulation lies over north Pakistan & neighborhood between 4.5 and 5.8 Km above mean sea level. Due to this system, entire northern parts of county will receive thunderstorm with hail activities on Day-1 and Day2.

The upper air cyclonic circulation over south Chhattisgarh & adjoining Odisha extending upto 0.9 km above mean sea level persists. The trough from this system to Rayalaseema and extends upto 0.9 Km above mean sea level. This will give rise to thunderstorm with gusty winds activities over Orissa, Jharkhand, Bihar and SHWB on Day-1.

##### **24 hour Advisory for IOP:**

Andaman and Nicobar Islands

Jammu & Kashmir, Himachal Pradesh, Uttarakhand, West and East UP

West and East Rajasthan, Haryana, Punjab

East Assam.

Kerala, South and North Interior Karnataka, Coastal Karnataka, Interior Tamilnadu, North Coastal Andhra Pradesh, Rayalaseema

Orissa, Bihar, Jharkhand, West Bengal, Sikkim

##### **48 hour Advisory for IOP:**

Andaman and Nicobar Islands

Jammu & Kashmir, Himachal Pradesh, Uttarakhand, West and East UP

West and East Rajasthan, Haryana, Punjab

Kerala, South and North Interior Karnataka, North Coastal Andhra Pradesh, Interior Tamilnadu

Odisha

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)

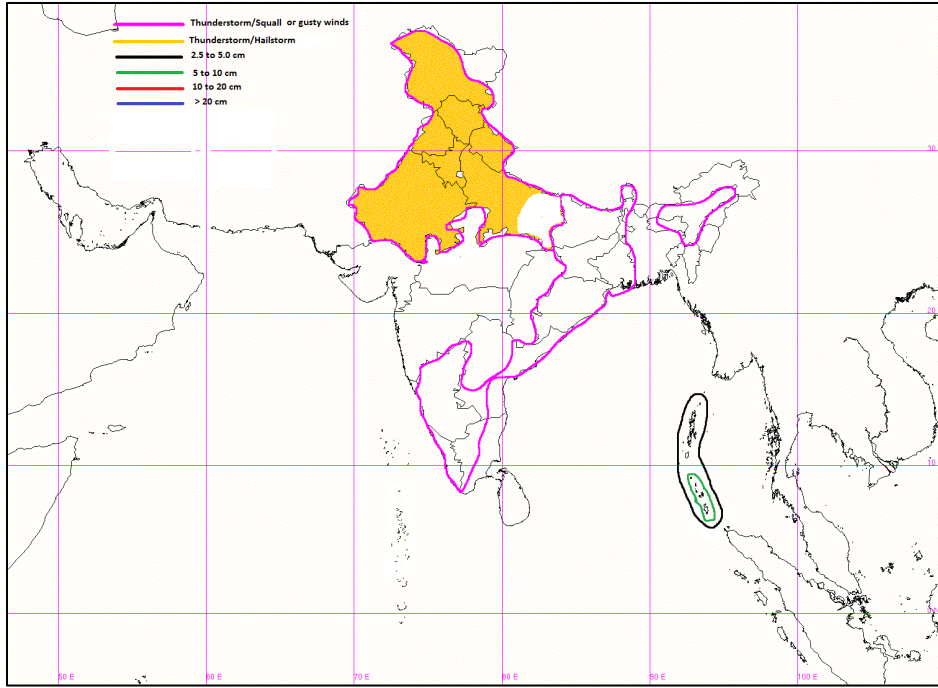
HEM: [http://satellite.imd.gov.in/img/3Ddaily\\_he.jpg](http://satellite.imd.gov.in/img/3Ddaily_he.jpg)

ForRadarimagesofthepast24hoursincludingmosaicofimages:

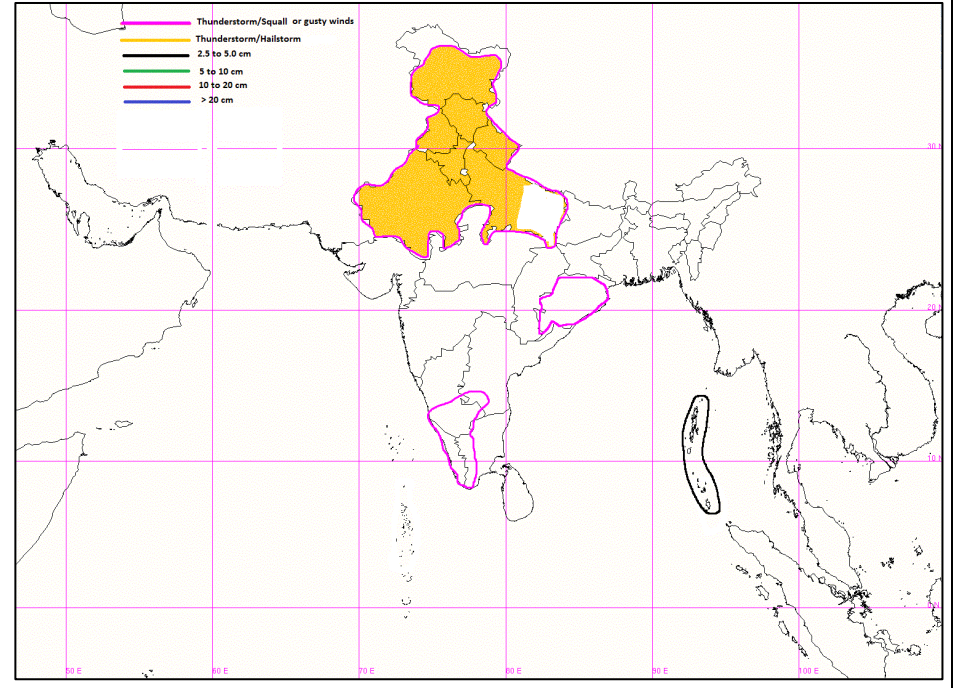
[http://ddgmui.imd.gov.in/dwr\\_img/](http://ddgmui.imd.gov.in/dwr_img/)

Satellite sounder based T- Phigram

[http://satellite.imd.gov.in/map\\_skm2.html](http://satellite.imd.gov.in/map_skm2.html)

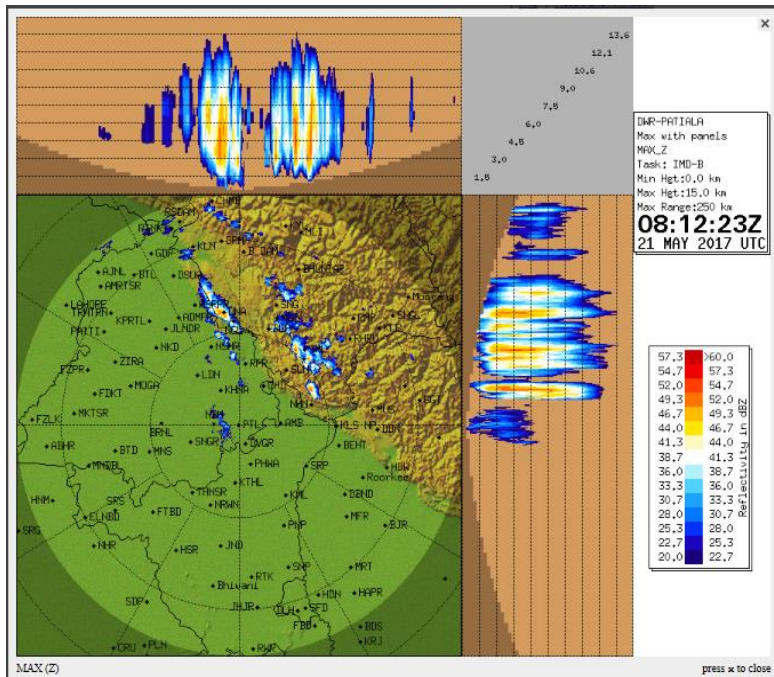


**IOP Advisory for 24 hours**

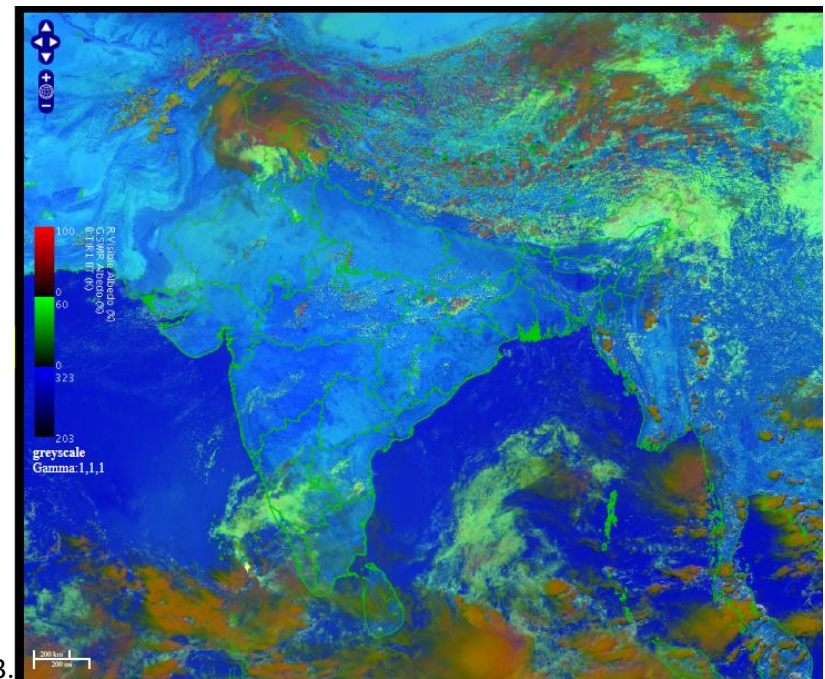


**IOP Advisory for 48 hours**



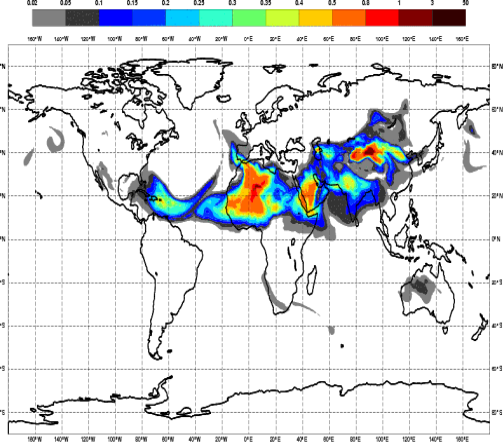


DWR Patiala at 0812UTC(1342hrs IST)

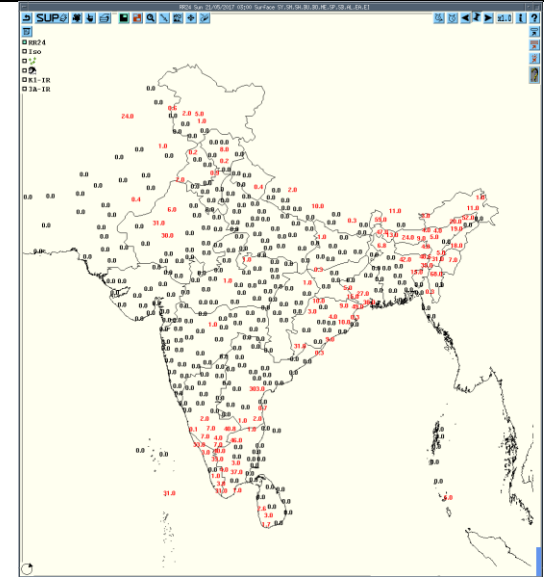
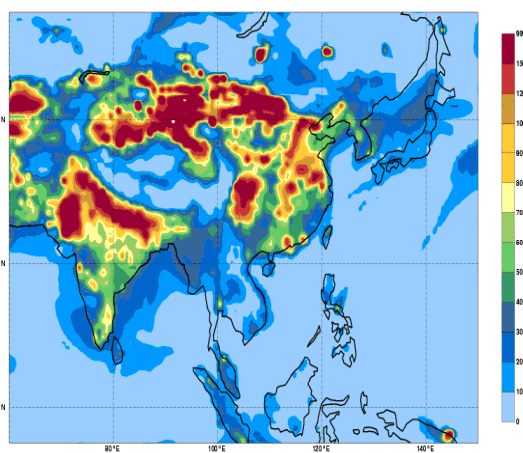


RAPID RGB Satellite Imagery at 1300 hrs IST of today

Saturday 20 May 2017 00UTC CAMS Forecast (+120 VT: Thursday 25 May 2017 00UTC)



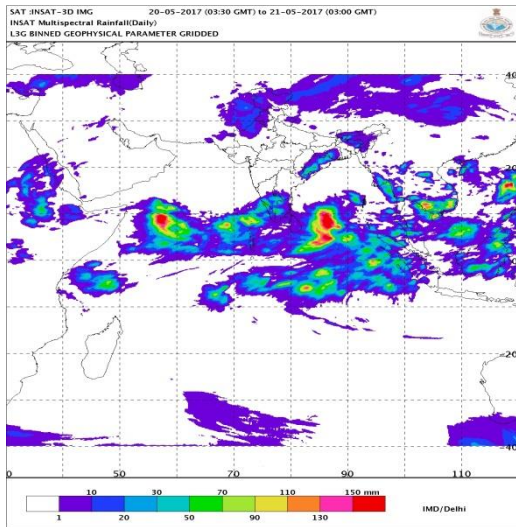
Saturday 20 May 2017 00UTC CAMS Forecast (+120 VT: Thursday 25 May 2017 00UTC)



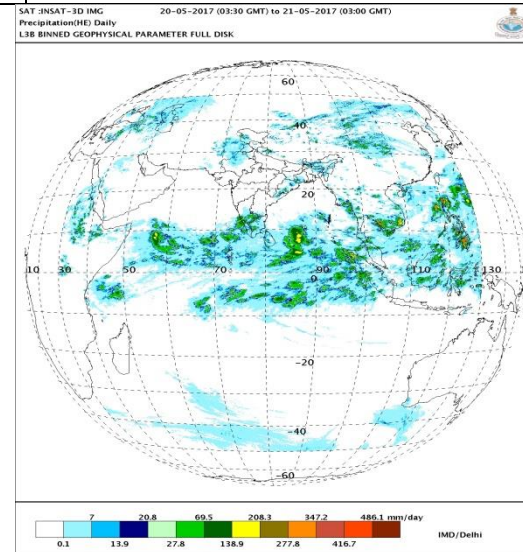
**Forecast Dust Concentration for 00UTC of 25<sup>th</sup> May**

**PM10 Forecast for 00UTC of 25<sup>th</sup> May**

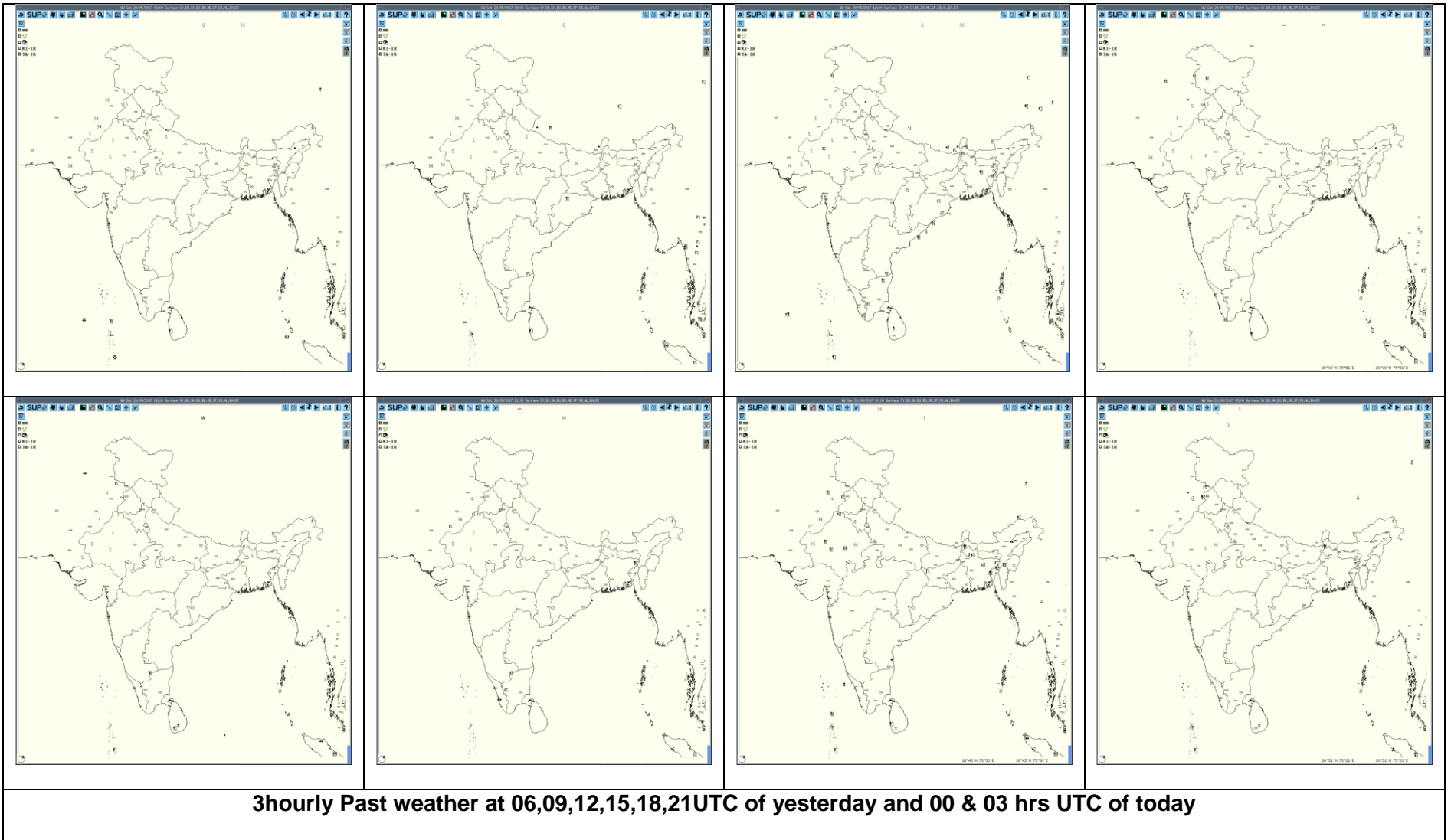
**Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today**

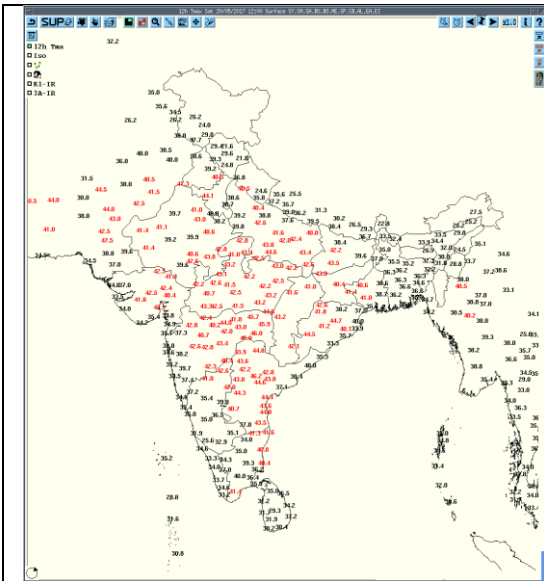


**IMR Rainfall**

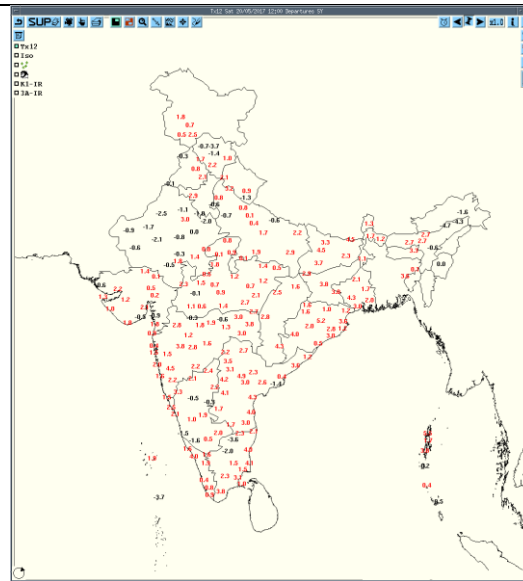


**HEM Rainfall**

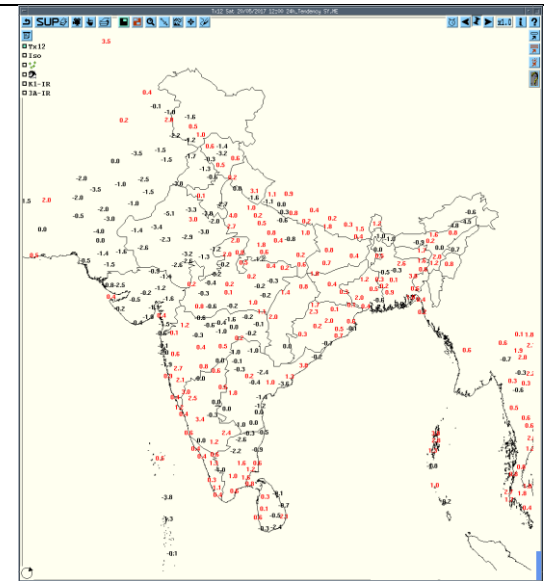




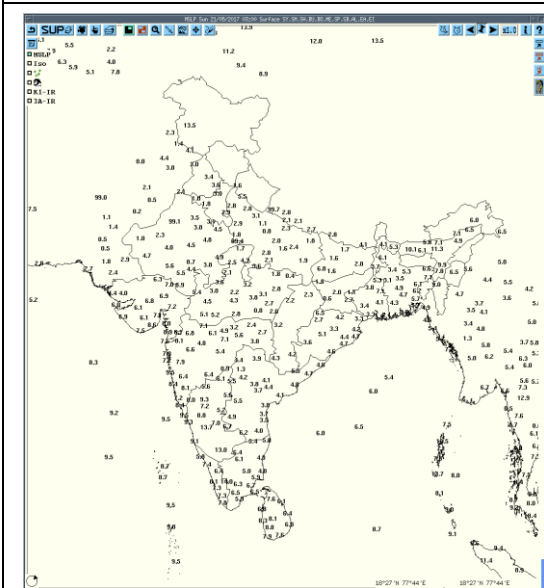
Tmax



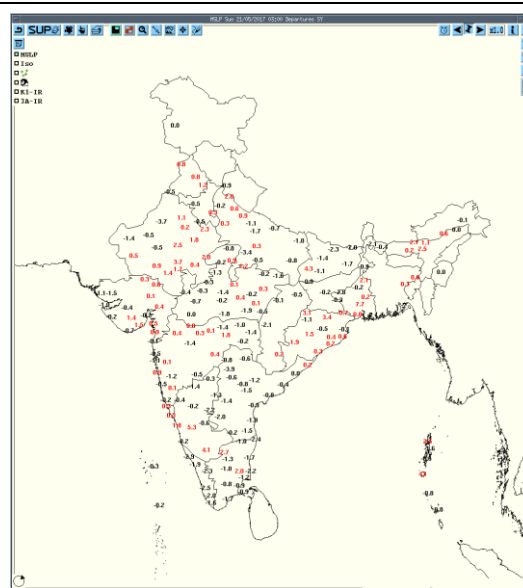
Departure Tmax



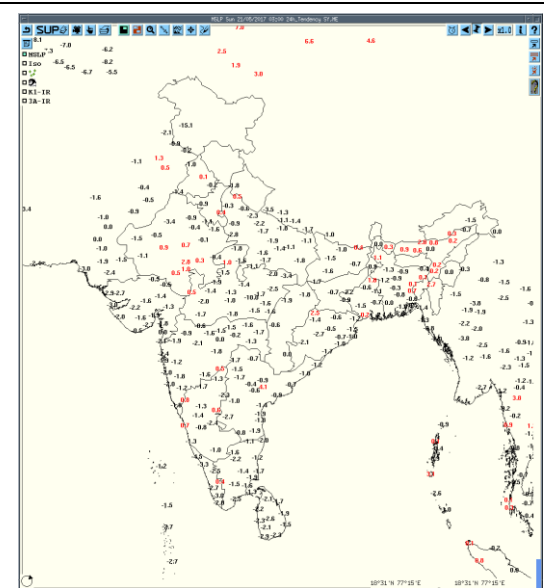
Tendency Tmax



MSLP



Departure MSLP



Tendency MSLP



| Realized weather past 24hours (Based on SYNERGIE Products) |                   |                               |          |                               |               |
|--|-------------------|-------------------------------|----------|-------------------------------|---------------|
| Date   | Time of Reporting | Name of Station Reporting     | Region   | STATE                         | Weather Event |
| 20-05-17   | 0600UTC           | Minicoy                       | S India  | Lakshadweep & Minicoy Islands | Thunderstorm  |
| 20-05-17   | 0900UTC           | Jharsuguda                    | E India  | Odisha                        | Thunderstorm  |
|  |                   | Tirupati                      | S India  | Andhra Pradesh                | Thunderstorm  |
| 20-05-17   | 1200UTC           | Phalodi                       | NW India | Rajasthan                     | Thunderstorm  |
|  |                   | Bagdogra                      | NE India | West Bengal                   | Thunderstorm  |
|  |                   | Kailasahar                    | NE India | Tripura                       | Thunderstorm  |
|  |                   | Keonjhargarh, Gopalpur        | E India  | Odisha                        | Thunderstorm  |
|  |                   | Pendra Road                   | C India  | Chhattisgarh                  | Thunderstorm  |
|  |                   | Vishakhapatnam, Tirupati      | S India  | Andhra Pradesh                | Thunderstorm  |
|  |                   | Vellore, Kodaikanal           | S India  | Tamilnadu                     | Thunderstorm  |
|  |                   | Punalar, Kozhikode            | S India  | Kerala                        | Thunderstorm  |
| 20-05-17   | 1500UTC           | Srinagar                      | NW India | J & K                         | Thunderstorm  |
|  |                   | Ajmer                         | NW India | Rajasthan                     | Lightening    |
|  |                   | Kozhikode, Thiruvananthapuram | S India  | Kerala                        |               |
|  |                   | Bengaluru                     | S India  | Karnataka                     | Lightening    |
|  |                   | Tiruchirappalli               | S India  | Tamilnadu                     | Lightening    |
|  |                   | Ramagundam                    | S India  | Telangana                     |               |
|  |                   | Bhubaneshwar, Balasore        | E India  | Odisha                        |               |
|  |                   | Chandbali                     | E India  | Odisha                        | Lightening    |
|  |                   | Ambikapur                     | C India  | Chhattisgarh                  |               |
| Digha  | E India           | West Bengal                   |          |                               |               |
| 20-05-17   | 1800UTC           | Bikaner                       | NW India | Rajasthan                     | Lightening    |
|  |                   | Bengaluru                     | S India  | Karnataka                     | Thunderstorm  |
| 20-05-17   | 2100UTC           | Bikaner                       | NW India | Rajasthan                     | Liughtening   |
|  |                   | Bengaluru                     | S India  | Karnataka                     | Thunderstorm  |
|  |                   | Coimbatore                    | S India  | Tamilnadu                     | Thunderstorm  |
| 21-05-17   | 0000UTC           | Phalodi, Jodhpur, Ganganagar  | NW India | Rajasthan                     | Thunderstorm  |
|  |                   | Ajmer                         | NW India | Rajasthan                     | Duststorm     |
|  |                   | Minicoy                       | S India  | Lakshadweep & Minicoy Islands |               |
|  |                   | Bengaluru                     | S India  | Karnataka                     |               |
|  |                   | Kailasahar, Agartala          | NE India | Tripura                       |               |
|  |                   | Silchar                       | NE India | Assam                         |               |

|          |          |          |          |             |              |
|----------|----------|----------|----------|-------------|--------------|
| 21-05-17 | 0300 UTC | Amritsar | NW India | Punjab      | Thunderstorm |
|          |          | Bagdogra | E India  | West Bengal | Thunderstorm |
|          |          | Lengpui  | NE India | Mizoram     |              |

### 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                    |
|--------------------|-------------------|------------------------------------|--|---|---|----------------------------------|---------------------------------------|
| Nagpur             | 21-05-17          | 0230-0502                          | Single becomes multiple at 0302 in NE  | 160 km in NNE, moving NE'y                              | MaxZ=29.50 with cloud ht.=3.5 to 5.8 km   | 0230-0502                        | Single becomes multiple at 0302 in NE |
|                    |                   | 0752-0922                          | Single but later becomes multiple  | 220 km in NE, moving E'y                                | MaxZ=29.50 with cloud ht.=5 to 8 km   | 0752-0922                        | Single but later becomes multiple     |
|                    |                   | 0822-1132                          | Single   | 150 km in NNW, moving E'y                               | MaxZ=29.50 with cloud ht.=3 to 8.1 km..<br>At 1022,MaxZ=41 with cloud ht.=3 to 4.7 km & for rest 3 to 9.3 km. | 0822-1132                        | Single                                |
|                    |                   | 0842-1132                          | Single later becomes multiple  | 160 km in NE, moving E'y                                | MaxZ=39 with cloud ht.=3.5 to 5 km, for rest 30 to 35 dBZ ht. of cloud =3.5 to 9 km                           | 0842-1132                        | Single later becomes multiple         |

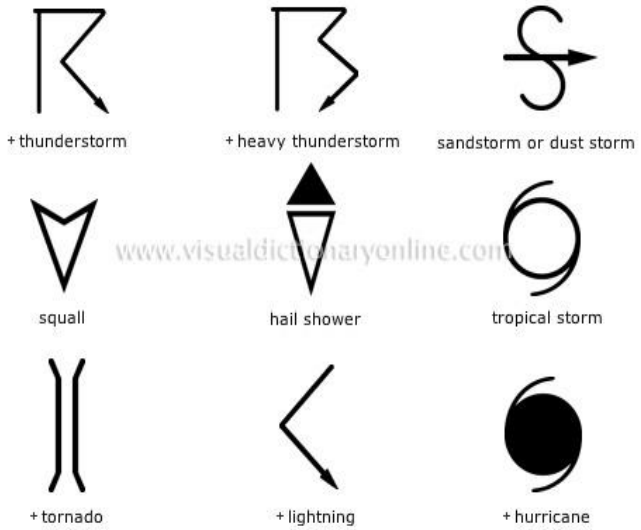
|          |            |                                |   |   |   |   |   |
|----------|------------|--------------------------------|---|---|---|---|---|
|          |            | 0002-0252                      | Nil   |   |   | 0002-0252   | Nil   |
| Paradeep | 20-05-2017 | 0700-1700                      | First isolated cloud formed at Lat 20.50 deg N and Lon 84.33 deg E having reflectivity 42 dBZ with an average height of 14 km at 1232 IST. Then after some time convective cloud mass appeared in NW, E, SSW direction. These cloud masses moved towards SE direction with a speed of 35 km/hr having maximum reflectivity 56 dBZ with an average height of 15 km and these were dissipated after moving some distance. | Cloud region obtained in the radius of 250 km from station at SSW,EAST,NW direction. Clouds moved towards SE direction. | All clouds were dissipated after 2200 IST over the sea region.                          | Thunderstorm And Rain   | Phulbani,Kalahandi ,Gajapati, Sambalpur,Jharsuguda,Sonepur Baragarh,Debgarh, Keonjhar, Anugul,Dhenkanal |
| Jaipur   | 21-05-17   | 21/05/17                       | 1140-1400 UTC   | Multiple cell with average height of 2.5 km maximum reflectivity 46.0 dBZ   | Cell develop 1140 to 1350 UTC towards SW of jaipur and movment SSE at speed 12-26 km/hr | Cells continuous forming from 1140UTC SW of Jaipur and maximum refelectivity during 1150-1350 UTC and died down at 1400 UTC | Moderate Thunderstorm at isolated places  |
| Srinagar | 21-05-17   | 20 MAY 03Z to 21May 03Z(24hrs) | Multiple cells developed in all direction of DWR Srinanar at 0700utc  | Developed at around 0700 utc till 1700utc .(From 2050utc-   | Thunder and light rain reported from Phalgam . kukernag                                 | NIL   | <b>NIL</b>  |



|          |          |                 |  |  |  |                                      |  |
|----------|----------|-----------------|--|--|--|--------------------------------------|--|
|          |          |                 | with max. reflectivity 50-55 DBZ and average height 9 km   | 0300utc image not display due to non availability of internet)                             | Qazigund ;SRINAGAR;KUPWARA ;BANIHAL.   |                                      |  |
| Patna    | 21-05-17 | 200300-210300   | Nil  | --   | --   | --                                   | --                                     |
| Agartala | 21-05-17 | 200300 - 200400 | Multiple cells with Maximum Height 10 km and maximum reflectivity 30 dBZ (at 0350 UTC of South Assam)  | Formed 200 km North of DWR AGT at 2330 UTC and moved SE-wards at around 40 kmph            | At 0400 UTC, cells persisted over South Assam before the DWR was shut down for maintenance   | TS with light rain                   | East Khasi hills district of Meghalaya |
|          |          | 200400-210300   | DWR under Maintenance  |  |  |                                      |  |
| Kolkata  | 21-05-17 | 0301- 0921 UTC  | NIL  | NIL  | NO ECHO  | NIL                                  | NIL                                    |
|          |          | 0931 – 1751 UTC | 1. Isolated single cells, transformed into multi cells system with maximum reflectivity of 57.5 dBz at 1051 UTC and maximum height of 11.65 km at 1051 UTC | 1. WNW (208.2 km) moving in SE-ly direction with a speed of 32.6 kmph.                     | 1. Isolated single cells formed in WNW at a distance of 208.2 km from Radar at 0931 UTC, Matured and merged with cell no. 2 at 1051 UTC. | Thunderstorm /Squall/ Rain           | N/A                                    |
|          |          |                 | 2. Isolated single cell transformed into multi cells system with maximum reflectivity of 63.5 dBz at 1051 UTC and maximum height of 15.05 km at 1021 UTC   | 2. W (205.4 km) moving in ESE-ly/ SE-ly direction with a speed of 38.0 kmph.               | 2. Isolated single cells formed in W at a distance of 205.4 km from Radar at 1001 UTC, Matured and merged with cell no. 1 at 1051 UTC.   | Hailstorm/Thunderstorm /Squall/ Rain | N/A                                    |
|          |          |                 | 3. Extended multi celled system with maximum reflectivity of 66.0 dBz at 1211 UTC and maximum height of 16.9 km at   | 3. From W/196 km To WNW/163 km moving in E-ly/ ESE-ly direction with a speed of 58.7 kmph. | 3. Extended multi celled system formed in between W/196 km To WNW/163 km from Radar at 1051 UTC by merging of SN. 1 and 2.               | Hailstorm/Thunderstorm /Squall/ Rain | N/A                                    |

|               |          |                                      | 1151 UTC  |   | Matured and dissipated at 1511 UTC in S at a distance of 71 km from Radar.         |  |   |   |
|---------------|----------|--------------------------------------|---|---|--|--|---|---|
|               |          | 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                          |   |
| Patiala       | 21-05-17 | 20 MAY 0002 UTC- TO 0302 UTC         | Multiple cells Max= 52.0 dBz Ht.= 09-11 km  | Formation in NW sector. MOVEMENT SE-WARDS.                        | -----  | -----  | AMBALA; LUDHIANA; ROPAR; CHANDIGARH; NANGAL |   |
|               |          | 20 MAY 0302 UTC- TO 0602 UTC         | Multiple cells Max= 51.0 dBz Ht.= 08-11 km  | Formation in NW sector. MOVEMENT SE-WARDS.                        | -----  | TS/RA  | NAWANSHAR; PATIALA; KALSI.                  |   |
|               |          | 20 MAY 0602 UTC- TO 0902 UTC         | NO SIGNIFICANT DEVELOPMENT.   | -----   | -----  | -----  | -----                                       | -----   |
|               |          | 20 MAY 0902 UTC TO 1802 UTC (09 HRS) | NO SIGNIFICANT DEVELOPMENT.   | -----   | -----  | -----  | -----                                       | -----   |
|               |          | 20 MAY 2102UTC- TO 0002 UTC          | Multiple cells Max= 48.5 dBz Ht.=9-11 km  | FORMATION IN WEST SECTOR. DIRECTION ,MOVEMENT IN EAST DIRECTION - |  |  |   | TARANTARAN; KAPURTHLA; JALANDHAR; FAZILKA; MUKTSAR. |
|               |          | 21 MAY 0002 UTC- TO 0302 UTC         | Multiple cells Max= 43.5 dBz Ht.=08-10 km   | FORMATION IN NW – SECTOR. DIRECTION MOVEMENT IN NNE-WARDS.        | -----  | RA   |   | AMRITSAR, BATALA, GURDASPUR.                        |
| Machilipatnam | 21-05-17 | 0711 to 1221 UTC                     | Isolated Multiple cells average height of 12 km with maximum reflectivity of 66dBZ  | NE(116KM) and moving S ly direction with average speed of 26 kmph | Cell started forming at 0711UTC, at NE (246km) from Radar the maximum reflectivity | Possibility of Thunder storm with Hail and rain with | Visakhapatnam and East Godavari Districts   |   |

|  |  |                 |   |  |   |  |  |
|--|--|-----------------|---|--|---|--|--|
|  |  |                 |   |  | during 0711 to 1211 UTC and died down at 1221UTC  | moderate winds.  |  |
|  |  | 0841 to 1431UTC | Isolated Multiple cells average height of 10 km with maximum reflectivity of 69.5 dBZ | NE (209KM) and moving E ly direction with average speed of 45 kmph | Cells started forming at 0841UTC at N (232KM ) from Radar the maximum reflectivity during 0851 to 1411 and died Down at 1431UTC | Possibility of Thunder storm with Hail and Rain with strong winds. | Dantewara, Malkangiri, Visakhapatnam and East Godavari Districts |
|  |  | 0951 to 1251UTC | Isolated Multiple cells average height of 8 km with maximum reflectivity of 57.5 dBZ  | W (84KM). The cell is stationary.                                  | Cells started forming at 0951UTC at NW(82km) from Radar the maximum reflectivity during 1101 to 1241 and died Down at 1251UTC   | Possibility of Thunder storm with Rain winds.                      | Guntur District  |



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