



**India Meteorological Department**  
**FDP STORM Bulletin No. 38 (12-04-2017)**

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

**SYNOPTIC FEATURES:**

The upper air cyclonic circulation over south Konkan & Goa and neighbourhood, now lies over south Madhya Maharashtra & adjoining North Interior Karnataka and extends upto 0.9 km above mean sea level. A trough runs from the above cyclonic circulation over south Madhya Maharashtra and adjoining North Interior Karnataka to south Tamilnadu and extends upto 0.9 km above mean sea level.

An upper air cyclonic circulation lies over northern parts of West Bengal and neighbourhood and extends upto 0.9 km above mean sea level. A trough runs from this system to south interior Odisha and extends upto 0.9 km above mean sea level.

The upper air cyclonic circulation over south Andaman sea and adjoining southeast Bay of Bengal, now seen as a trough of low lies over Andaman & Nicobar Islands & neighbourhood with an embedded upper air circulation over Andaman Sea and adjoining southeast Bay of Bengal and extends upto 3.1 km above mean sea level. It is very likely to become a low pressure area during next 48 hours and well marked during subsequent 24 hours.

The upper air cyclonic circulation over east Assam & neighbourhood extending upto 0.9 km above mean sea level has become less marked. A feeble Western Disturbance as an upper air cyclonic circulation lies over northeast Afghanistan and adjoining north Pakistan and extends upto 3.1 Km above mean sea level.

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

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

**Convective Activity:**

SCT LOW/MED CLOUDS WITH EMBDD MOD TO INT CONVTN OVER COMORIN SRILANKA GULF OF MANNAR SUMATRA S MALAY PENINSULA STR OF MALACCA N VIETNAM BORNEO S CHINA SEA S OF LAT 5.0N JAVA SEA CELEBES ILS N MOZAMBIQUE CHANNEL MADAGASCAR AND OVER INDIAN OCEAN BET LAT 5.0N TO 10.0S EAST OF LONG 80.0E (.)

**Arabian Sea:**

NO SIG CLOUD OVER THE REGION (.)

**Bay of Bengal & Andaman Sea:**

SCT LOW/MED CLOUDS WITH EMBDD MOD TO INT CONVTN OVER S BAY AND SOUTH ANDAMAN SEA (.)

**Convection:**

Light to moderate convection was observed over Arunachal Pradesh and South India.

**OLR:-** Up to 230 wm<sup>-2</sup> was over J&K, North Himachal Pradesh Extreme North Uttarakhand Sikkim Arunachal Pradesh South Interior Karnataka, South Kerala and North West Tamilnadu.

**Jet Stream:**

No Jet stream and trough observed over India.

**Dynamic Features:**

Positive shear tendency observed over India .

Low wind shear observed over south and moderate wind shear observed over North India and weak to moderate wind shear observed over central India .

A positive Vorticity field is seen over Uttarakhand, Uttar Pradesh, Bihar, West Bengal and Coastal Karnataka.

Positive Low Level Convergence observed over South Kerala, South Tamilnadu, Central Madhya Pradesh and Negative low level convergence observed over rest India.

#### **Precipitation:**

**IMR:** Rainfall upto 20mm was observed over South South Interior Karnataka. Rainfall upto 10mm was observed over East J&K, West North Interior Karnataka South Kerala and South Tamilnadu,.

**HEM:** Rainfall upto 14mm was observed over South Interior Karnataka and South Kerala. Rainfall Upto 7mm was observed over Extreme South Andhra Pradesh and North West Tamilnadu.

#### **RADAR and RAPID observation:**

Strong multiple echoes (dbZ >50, height >10km) are not seen in any radar domain at 1210 IST.

RAPID RGB Imagery of 1130 hrs IST also indicates convective clouds over Nicobar Islands.

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

No significant dust concentration observed over Arabian Peninsula and west Rajasthan. Dust concentration is expected to increase over north-west India for next three days.

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

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

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

12UTC Charts on all days from Day0-4 show trough in MSLP over J & K extending NW-SE.

12UTC charts on all days from Day0-4 show wind discontinuity at 925 hPa over two regions:(i) SW-NE extending from northern Karnataka-Telangana region to Odisha-WB region. (ii)S-N extending from southern parts of TN to northern parts of Karnataka-Telangana region.

CYCIR formation over BoB in Day 0 getting intensified as day progresses moving NE wards **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:**

At 12UTC on Day-1 to Day-4: High values along the western ghats in Karnataka, Maharashtra and Kerala

Day3-4: Parts of Odisha and WB along with adjoining Jharkhand and Chattisgarh.

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

At 12UTC : Scattered isolated values in Day-0 to Day-2. In Day-3 and 4 enhanced magnitude over some isolated regions of WB, Kerala and TN. High Cyclonic vorticity over BoB due to developing system

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

At 12UTC: Prominent over large west coast of Karnataka,Kerala some parts of Arunachal, Nagaland and Uttarakhand in Day-0 to Day-2. During Day-3 and Day-4 high magnitude over WB, Bihar, Bangladesh and adjoining Assam.

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

At 12UTC: Prominent over large west coast of Karnataka,Kerala some parts of Arunachal, Nagaland and Uttarakhand in Day-0 to Day-2. During Day-3 and Day-4 high magnitude over WB, Bihar, Bangladesh and adjoining Assam. Additionally moderate values of index are prominent over large parts of BoB associated with system.

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

At 12UTC : High values over coast of Karnataka Kerala and parts of Tamilnadu, coastal AP and Odisha and Uttarakhand and Arunachal in Day0- Day-1. In Day-2, enhanced magnitude over J & K region

Day-3: Enhanced values of TTI over J & K, Himachal and Uttarakhand, fresh development over coastal Maharashtra

Day-3&4: Increased values over coast of Maharashtra and Karnataka, parts of Bihar, WB and NE states

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

Rainfall > 2 cm/day: Day-1&2 over some parts of Kerala, Karnataka and Tamilnadu

Day-3 over western part of Assam and some parts of adjoining Meghalaya and Arunachal Pradesh.

Rainfall >4cm/day in Day-3 over Assam Meghalaya and Arunachal.

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

**NOT RECEIVED**

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

**NOT RECEIVED**

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

**Summary and Conclusions:**

In association with the trough that runs from south Madhya Maharashtra to south Tamilnadu, thunderstorm activity accompanied by gusty winds is expected over Karnataka and Kerala on day 1. The trough is likely to persist on day 2, and associated thunderstorm activity is likely to persist over the same region.

In association with upper air cyclonic circulation over northern parts of West Bengal and neighbourhood, there is a southerly wind flow in the lower levels into North-east India. This is likely to result in thunderstorm activity accompanied by gusty winds over Tripura, Meghalaya and adjoining South Assam on day 1. The cyclonic circulation is likely to move eastwards on day 2. The associated thunderstorm activity accompanied by squall and hail on day 2 is likely over Meghalaya, Manipur, Nagaland and adjoining Assam.

In association with the upper air cyclonic circulation over south Andaman sea and adjoining southeast Bay of Bengal, thunderstorm activity is likely over Andaman and Nicobar islands. The rainfall is likely to intensify over Nicobar Islands on day 2.

## Day 1 & Day 2:

### 24 hour Advisory for IOP:

Andaman and Nicobar Islands  
Kerala and South Interior Karnataka  
South Assam, Meghalaya and Tripura

### 48 hour Advisory for IOP:

Andaman and Nicobar Islands  
Assam, Meghalaya, Nagaland, Manipur  
Interior Karnataka and Kerala

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)

Past 24 hour HEM and IMR rainfall (upto 03 UT Coftoday)

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

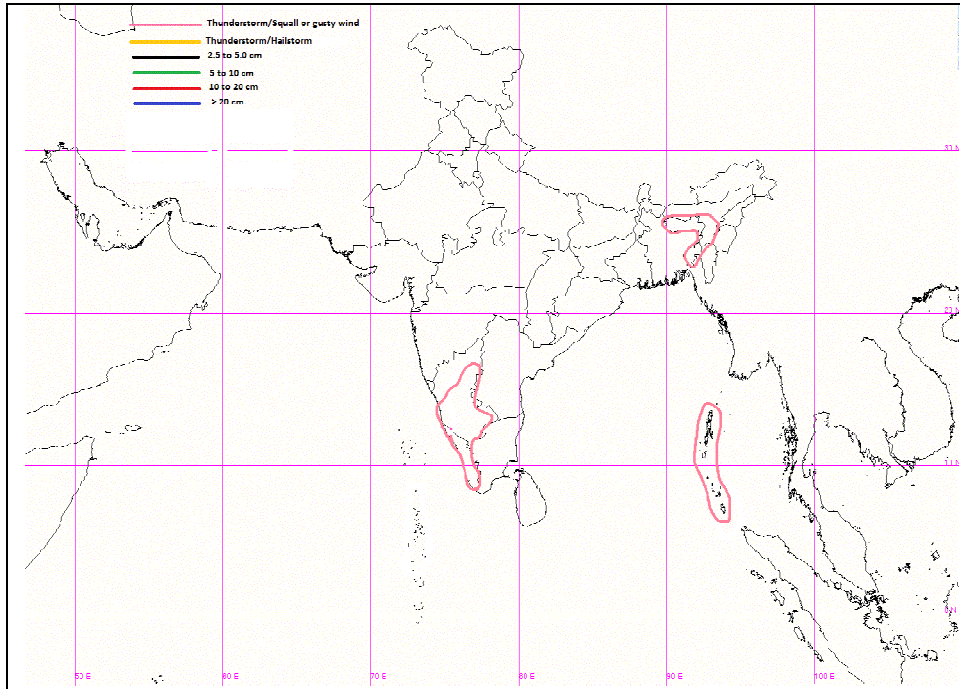
HEM: [http://satellite.imd.gov.in/img/3Ddaily\\_he.jpg](http://satellite.imd.gov.in/img/3Ddaily_he.jpg)

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

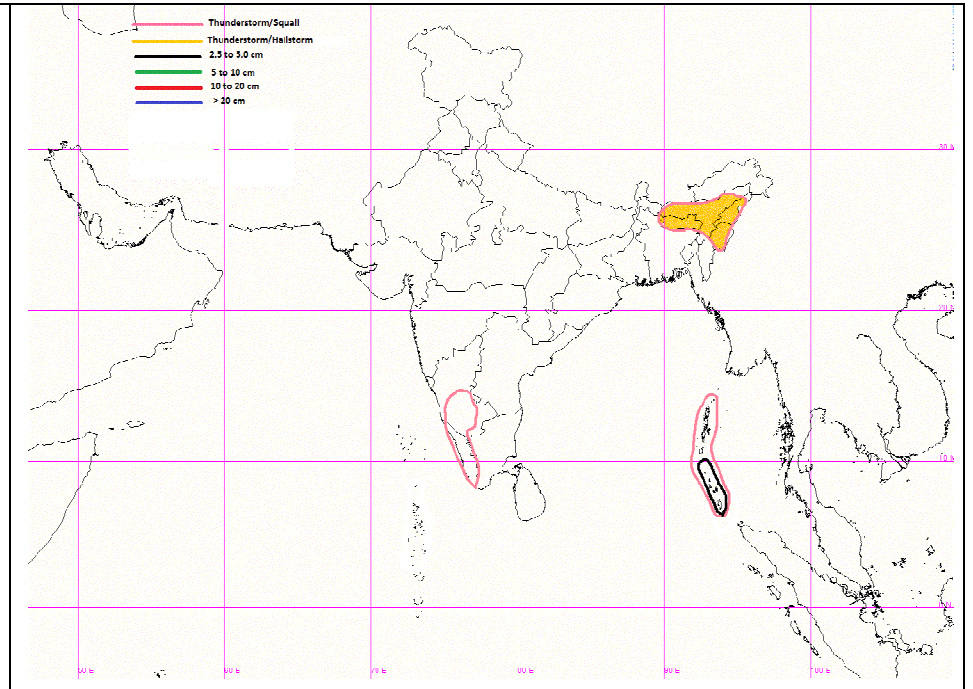
[http://ddgmui.imd.gov.in/dwr\\_img/](http://ddgmui.imd.gov.in/dwr_img/)

Satellite sounder based T-Phi gram

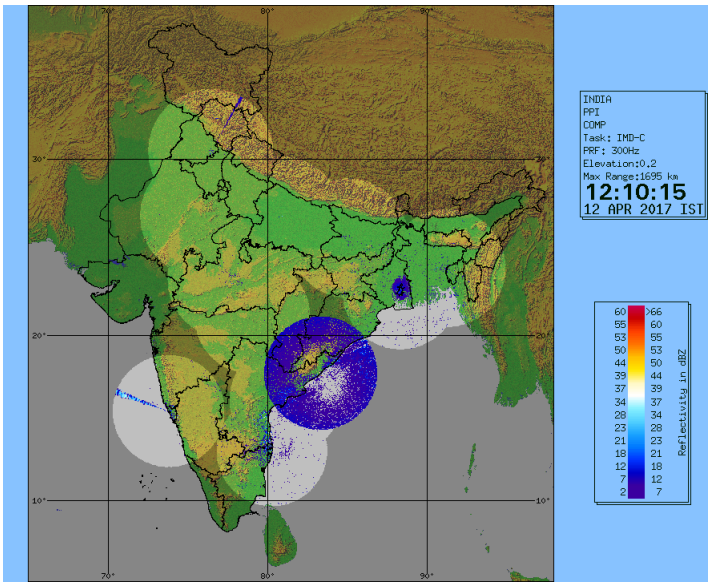
[http://satellite.imd.gov.in/map\\_skm2.html](http://satellite.imd.gov.in/map_skm2.html)



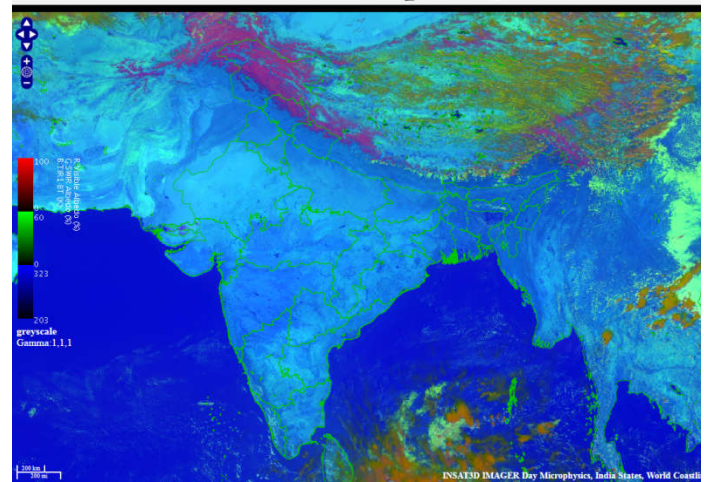
**IOP Advisory for 24 hours**



**IOP Advisory for 48 hours**



**Composite Image at 1210 hrs IST**

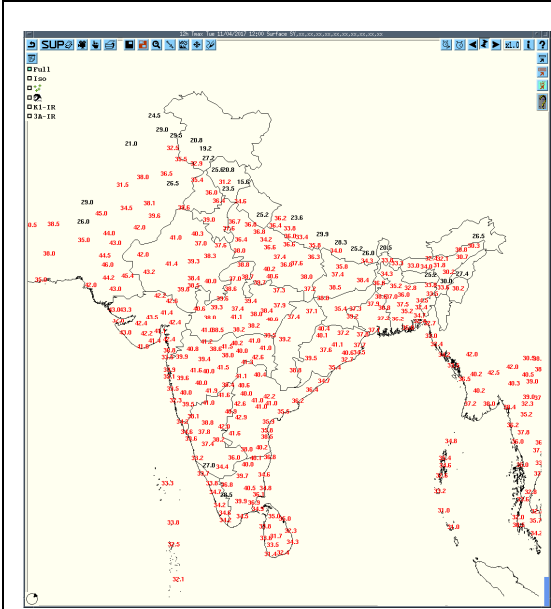


**RAPID RGB Image of INSAT 3D at 11:30 hrs IST**

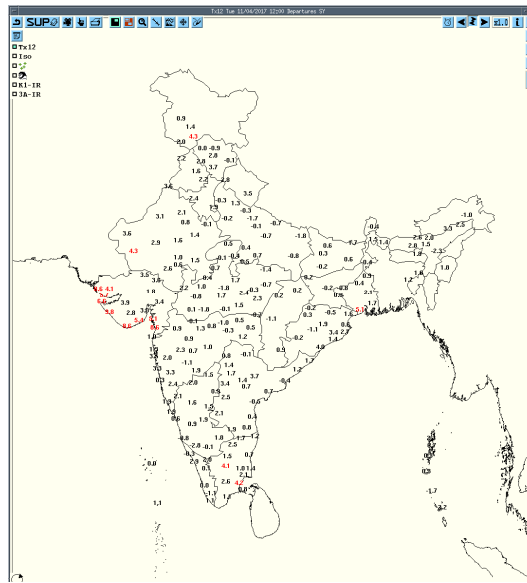




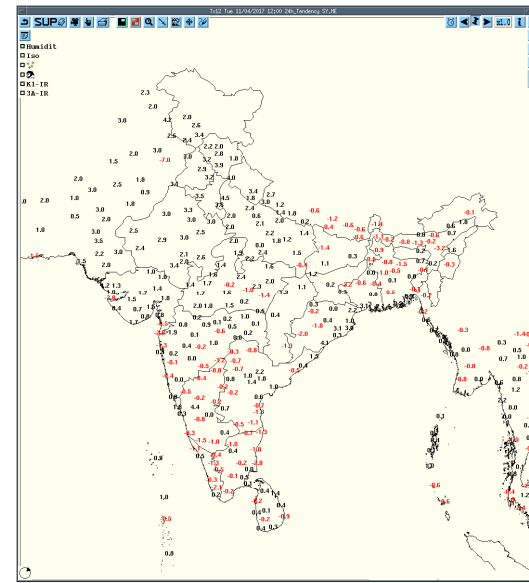




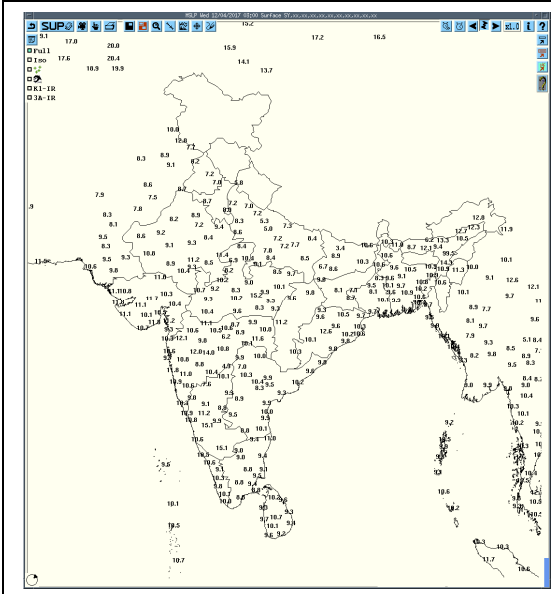
T<sub>max</sub>



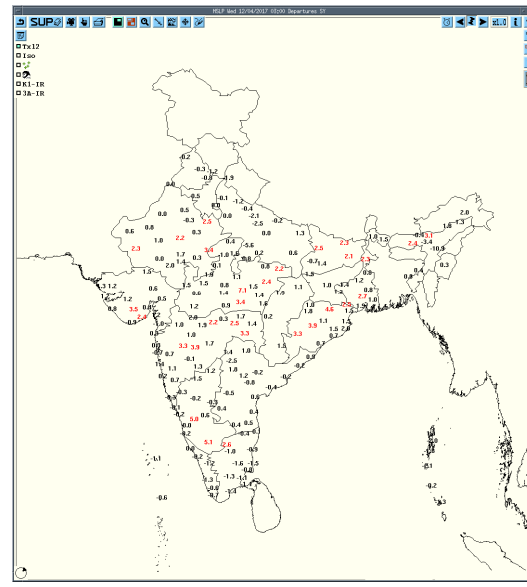
Departure T<sub>max</sub>



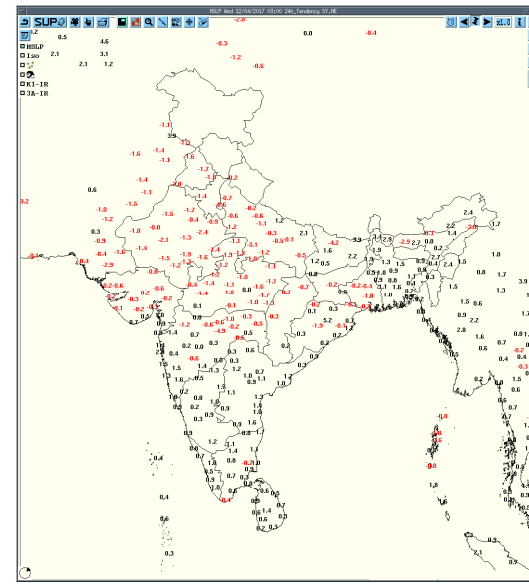
Tendency T<sub>max</sub>



MSLP



Departure MSLP



Tendency MSLP



| Realized weather past 24 hours (based on SYNERGIE data) |                   |                                     |             |           |               |
|---|-------------------|-------------------------------------|-------------|-----------|---------------|
| Date  | Time of Reporting | Name of Station Reporting           | Region      | STATE     | Weather Event |
| 11-04-2017  | 1200UTC           | Belgaum,Shimoga,Bajpe,Chamrajnagar  | South India | Karnataka | Thunderstorm  |
|   |                   | Thiruvananthapuram,Alapuzha,Punalur | South India | Kerala    | Thunderstorm  |

**Past 24 hours DWR Report:  
Machilipatnam**

| Radar Station name<br>DWR<br>Machilipatnam | 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 |
|--|------------------------------------|------------------------------------|--|---|---------|----------------------------------|--------------------|
|  | 03Z of 11/04/17 to 03Z of 12/04/17 | NIL                                | NIL  | NIL   | NIL     | NIL                              | NIL                |

**KOLKATA**

| Radar Station Name |            | 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 |
|--------------------|------------|------------------------------------|---|--|---------|----------------------------------|--------------------|
| DWR KOLKATA        | 11-04-2017 | 0311-1321 UTC                      | NIL   | NIL  | NO ECHO | NIL                              | NIL                |
|                    | 11-04-2017 | 1331-2351 UTC                      | NIL   | NIL  | NO ECHO | NIL                              | NIL                |
|                    | 12-04-2017 | 0001-0301 UTC                      | NIL   | NIL  | NO ECHO | NIL                              | NIL                |

## PATNA

| Radar Station Name | Date       | Time Interval Of Observation (UTC) | Organisation 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 |
|--------------------|------------|------------------------------------|--|--|---------|----------------------------------|--------------------|
| PATNA              | 12/04/2017 | 110300<br>-<br>120300              | NIL  | NIL  | N/A     | N/A                              | N/A                |

## AGARTALA

| Radar 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 |
|--------------------|----------|------------------------------------|--|---|---|----------------------------------|--------------------|
| AGARTALA           | 12/04/17 | 111530<br>-<br>111910              | Multiple Cells with Maximum Height <b>11 km</b> and maximum reflectivity <b>43 dBZ</b> (at 1700 UTC over South Assam)                                      | Formed NE (110 KM) from DWR Agartala, at 1530 UTC moved Eastwards at around 35 kmph | Cell dissipated at 1910 UTC of 11.04.17 over South Assam & Manipur      | N/A                              | N/A                |
|                    |          | 111650<br>-<br>112020              | Single Cell with Maximum Height <b>10 km</b> and maximum reflectivity <b>40dBZ</b> (at 1920 UTC over Khowai District of Tripura)                           | Formed WNW(40 KM) from DWR Agartala, at 1650 UTC moved ENE-wards at around 20 kmph  | Cell dissipated at 2020 UTC of 11.04.17 over Dhalai District of Tripura | N/A                              | N/A                |

## Paradeep

| Radar 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 |
|--------------------|----------|------------------------------------|--|---|---------|----------------------------------|--------------------|
| DWR Paradeep       | 11/04/17 | 0300-1800 UTC                      | Convective regions having max. reflectivity of 25dBZ and av. Heights not exceeding 5.5 kms.  | Position: 150-240 degrees in the range of 80-200 kms.   | NIL     | NIL                              | NIL                |

## VISAKHAPATNAM

| Radar 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 |
|--------------------|----------|------------------------------------|--|---|--|----------------------------------|--------------------|
| DWRVSK             | 11/04/17 | 0600 UTC-0900 UTC                  | Isolated single cell with average height of 7km with maximum reflectivity of 56 dBZ  | S(225KM) moving sly                                     | Cell start forming at 0601UTC at S (225 KM) from radar and start dissipating from 0611UTC. | -                                | ■                  |
| DWRVSK             | 11/04/17 | 0900 UTC-1200 UTC                  | Isolated single Cels are formed in south westerly with maximum reflectivity 45dBZ with average height 10kms .  | SW(110 Km) moving sly                                   | Cells with maximum reflectivity 45DBZ at 11.11 and start dying from 11:31UTC.              | -                                | ■                  |
| DWRVSK             | 11/04/17 | 1200 UTC-1500 UTC                  | Isolated single Cels are seen in NE with maximum reflectivity 54dBZ with average   | NE(165 Km) moving NEly                                  | -  | -                                | ■                  |

|        |          |                   |  |  |  |   |   |
|--------|----------|-------------------|--|--|--|---|---|
|        |          |                   | height 06kms .   |  |  |   |   |
| DWRVSK | 11/04/17 | 1500 UTC-1800 UTC | Multiple Cells are seen in NE & SW with maximum reflectivity 54dBZ with average height 05kms . | NE(140 to 220 Km) moving NEly          | -  | - | - |
| DWRVSK | 11/04/17 | 1800 UTC-0000 UTC | Multiple Cells are seen in SW & NE with maximum reflectivity 52dBZ with average height 06kms . | SW(46 to 220 Km from Radar) moving NWy | Cells are forming and dissipating quickly. | - | - |

### Lucknow

| DWR Station | Date       | Time interval of observation | Organization of the cells(isolated single cell/multiple cellsconvective 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 |
|-------------|------------|------------------------------|---|--|---------|-----------------------------------|--------------------|
| MC Lucknow  | 12/04/2017 | 110300 UTC TO 120300UTC      | NIL   | NIL  | NIL     | NIL                               | NIL                |

## NAGPUR

| Radar 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 |
|--------------------|----------|------------------------------------|--|---|-------------------|----------------------------------|--------------------|
| NAGPUR             | 11/04/17 | 0722-1052                          | <b>Single</b>  | <b>33 km NEE,moving NEE</b>                             | <b>&lt; 7 dBZ</b> | <b>Nil</b>                       | <b>Nil</b>         |
|                    |          | 1252                               | <b>Single</b>  | <b>125 km NWW</b>                                       | <b>20 dBZ</b>     |                                  |                    |
|                    |          | 1342-1702                          | <b>Single</b>  | <b>20 km E, moving SEE'ly</b>                           | <b>&lt; 7 dBZ</b> |                                  |                    |
|                    |          |                                    | <b>Second single cell</b>  | <b>124 km NEE</b>                                       | <b>&lt; 7 dBZ</b> |                                  |                    |
|                    | 12/14/17 | 0002-0302                          | <b>Nil</b>   | <b>Nil</b>  | <b>No Echoes</b>  | <b>Nil</b>                       | <b>Nil</b>         |












**PATIALA**

| Radar 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 (42101)    | 12/04/2017 | 11 April 0302 to 12 April 0252 UTC | Nil  | Nil   | No Echoes | Nil                              | Nil                |
|                    |            |                                    |  |   |           |                                  |                    |
|                    |            |                                    |  |   |           |                                  |                    |

## JAIPUR

| Radar 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 |
|--------------------|----------|------------------------------------|---|--|---------|----------------------------------|--------------------|
| MC JAIPUR          | 12/04/17 | 0300                               | NIL   | --   | -       | -                                | -                  |
|                    |          |                                    |   |  |         |                                  |                    |

|                        |                    |
|------------------------|--------------------|
| ∞                      | haze               |
| ☁                      | smoke              |
| ☼                      | dust or sand storm |
| ☁                      | fog                |
| ☂                      | drizzle            |
| •                      | rain               |
| ✪                      | snow               |
| ▽                      | showers            |
| △                      | hail               |
| ⚡                      | thunderstorm       |
| <b>Weather Symbols</b> |                    |

|   |   |   |
|---|---|---|
|  |   |  |
| + thunderstorm  | + heavy thunderstorm  | sandstorm or dust storm   |
|  |  |  |
| squall  | hail shower   | tropical storm  |
|  |  |  |
| + tornado   | + lightning   | + hurricane   |

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