



**India Meteorological Department**  
**FDP STORM Bulletin No.49 (23-04-2017)**

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

**SYNOPTIC FEATURES:**

The western disturbance as an upper air cyclonic circulation over north Pakistan & adjoining Afghanistan now lies over north Pakistan & neighbourhood and extends upto 3.1 Km above mean sea level with a trough aloft runs roughly along longitude 66.0°E and north of latitude 22.0°N.

The trough at mean sea level from northwest Rajasthan to north Coastal Odisha across north Madhya Pradesh, north Chhattisgarh and Jharkhand persists.

The upper air cyclonic circulation over northwest Uttar Pradesh & adjoining Haryana now lies over southwest Uttar Pradesh & neighbourhood and extends upto 0.9 Km above mean sea level.

The upper air cyclonic circulation over Bihar and adjoining Jharkhand & Gangetic West Bengal now lies over Jharkhand & neighbourhood and extending upto 1.5 Km above mean sea level.

The trough from Vidarbha to south Tamilnadu across Telangana and Rayalaseema now runs from the upper air cyclonic circulation over Jharkhand & neighbourhood to south Tamilnadu across interior Odisha and coastal Andhra Pradesh and extends upto 0.9 Km above mean sea level.

The upper air cyclonic circulation over Nagaland, Manipur, Mizoram & Tripura & neighbourhood extending upto 1.5 km above mean sea level persists.

The upper air cyclonic circulation over northeast Arabian Sea and adjoining Saurashtra & Kutch between 1.5 & 5.8 Km above mean sea level has become less marked.

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

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

**Convective Activity and cloud description:**

Scattered multi-layered clouds seen over J & K, Himachal Pradesh, N Punjab and Uttarakhand in association with western disturbance over the area. The trough in westerlies runs roughly north of latitude 15.0°N and longitude 60.0°E

Scattered low/medium clouds with embedded moderate to intense convection were seen over E Jharkhand, NE Odisha, S Tripura and S Bangladesh. Scattered low/medium clouds with embedded isolated weak to moderate convection were seen over central parts of S Uttar Pradesh and rest north eastern states. Scattered low/medium clouds were seen over rest Punjab, rest Odisha, N Chhattisgarh, rest Jharkhand, E Rajasthan, NW Madhya Pradesh, Kerala, Tamilnadu and S Rayalaseema.

**Arabian Sea:**

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

**Bay of Bengal & Andaman Sea:**

Scattered low/medium clouds with embedded isolated weak to moderate convection were seen over S Andaman sea.

## **Past Weather:**

### **Convection:**

Moderate to Intense convection was observed over J&K Himachal Pradesh Punjab Uttarakhand Jharkhand Sikkim North-East States south interior Karnataka Kerala & Tamilnadu.

### **OLR:-**

Up to 280  $\text{wm}^{-2}$  was over Punjab Himachal Pradesh east Uttar Pradesh Bihar Jharkhand Gangetic West Bengal Andhra Pradesh South Interior Karnataka Kerala & west Tamilnadu.

Up to 310  $\text{wm}^{-2}$  was over north Haryana west Uttar Pradesh Chhattisgarh Bihar & Orissa.

Up to 340  $\text{wm}^{-2}$  was over rest parts of India.

### **Westerly Trough & Jet Stream:**

Trough in Westerlies runs roughly north of Lat 15.0N along Long 60.0E. No jet stream observed

### **Dynamic Features:**

Negative shear tendency observed over Mizoram Tripura and Positive shear tendency observed over rest parts of India.

Medium to high wind shear is observed over India.

A positive Vorticity field is observed over coastal Andhra Pradesh east Uttar Pradesh adjoining Bihar .

Negative low level convergence observed over Uttarakhand Uttar Pradesh Vidarbha, Madhya Maharashtra Konkan & east Gujrat and Positive Low Level Convergence observed over Bihar adjoining SHWB Sikkim NE States & coastal Odisha

### **Precipitation:**

#### **IMR:**

Rainfall upto 50 was observed over west Gangetic West Bengal . Rainfall upto 30 was observed over extreme north-west J&K, Tripura adjoining Bangladesh, extreme north Tamil Nadu. Rainfall upto 20 mm was observed over west J&K north Himachal Pradesh .Rainfall upto 10 mm was observed over rest J&K rest Himachal Pradesh north Punjab Uttarakhand extreme north east Bihar rest North-East States north-west Tamil Nadu .

**HEM:** Rainfall upto 28 to 70 mm was observed over west J&K, Tripura, Mizoram extreme north-west Tamil Nadu. Rainfall upto 14 mm was observed over Punjab, north-west Uttar Pradesh, West Bengal and rest NE States.

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

DWR composite at 1620hrs IST indicated significant convection over western parts of Gangetic West Bengal and north Tamilnadu.

Isolated/multiple strong echoes were seen in DWR Kolkata (dBZ >55 & height >15km) and DWR Chennai (dBZ >55 & height around 15km) at 1050 UTC(1620hrs IST). Isolated/multiple weak to moderate echoes were also seen in DWR Paradeep, Lucknow, Agartala and Patna at 1050 UTC.

RAPID RGB imagery at 1530hrs IST indicated convective clouds over J & K, Himachal Pradesh, Uttarakhand, Central parts of Uttar Pradesh, N Punjab, Tamilnadu, Kerala, East Jharkhand adjoining West Bengal, East Odisha, North Andhra Pradesh, Tripura and Mizoram.

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

Dust concentration was observed over Arabian Peninsula. Dust concentration is expected to increase over north India for next five days.

High PM10 concentration was observed over western India. PM10 concentration is expected increase over north 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 all the days from day-0 to Day-1 show feeble trough over J & K.

12UTC Charts of Day-0 to Day-4 show moderate **Heat Low over Rajasthan and adjoining Pakistan** and its extension over IG plains is prominent with MSLP is at around 1000 hPa.

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

Trough at 850 hPa over WB and Bangladesh region from Day-0 to Day-2. CyCIR over Srilanka from Day-3-4. Strong anti-cyclone at 500 hPa from Day-0 to Day-4 over southern peninsula moving from west coast to wards coastal AP.

#### 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 Day-0,1&3: high values over isolated locations over Odisha, Jharkhand and parts of TN. Over Assam in day1,2&3. And in day-4 at several locations along the western ghats.

**At 00UTC very high values : over Tripura, Manipur region in Day-1, several places in Assam in Day-2, and over Assam-Arunachal region in Day-3 & 4**

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

At 12UTC : very high values at isolated location over Jharkhand in day-0, over Assam, Bangladesh-Meghalaya border in day-1-3. Over WB and adjoining states and over Assam in Day-1. At several places over Assam in Day-2 to Day-4

At 00UTC : very high values along the line of low level confluence and strong convergence.

#### 5. Showalter Index: Day-wise Sub-divisions with Showalter index <-4:

**Day0:** Arunachal\_Pradesh, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, Uttarakhand, Himachal\_Pradesh, Jammu\_Kashmir, West\_RJ, Odisha, Coastal\_AP, TN\_Puducherry, Coastal\_Karnataka, SI\_Karnataka, Kerala,

**Day1:** Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, Uttarakhand, Himachal\_Pradesh, Jammu\_Kashmir, Saurashtra\_Kutch, Coastal\_AP, Telangana, TN\_Puducherry, Kerala,

**Day2:** Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Uttarakhand, Himachal\_Pradesh, Jammu\_Kashmir, TN\_Puducherry, Kerala,

**Day3:** Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Uttarakhand, Himachal\_Pradesh, Jammu\_Kashmir, Odisha, Coastal\_AP, TN\_Puducherry, Kerala,

**Day4:** Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Bihar, Uttarakhand, Himachal\_Pradesh, Jammu\_Kashmir, West\_RJ, Coastal\_AP, Telangana, TN\_Puducherry, SI\_Karnataka, Kerala

#### 6. K-Index : Daywise Sub-divisions with K-index >40:

**Day0:** Arunachal\_Pradesh, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, West\_UP, Uttarakhand, Jammu\_Kashmir, West\_RJ, Odisha, Coastal\_AP, Telangana, TN\_Puducherry, SI\_Karnataka, Kerala,

**Day1:** Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Bihar, East\_UP, Uttarakhand, Jammu\_Kashmir, West\_RJ, Saurashtra\_Kutch, Coastal\_AP, Telangana, TN\_Puducherry, NI\_Karnataka, SI\_Karnataka, Kerala,

**Day2:** Arunachal\_Pradesh, NE\_NMMT, Sub\_Himalayan\_WB, Uttarakhand, TN\_Puducherry, Kerala,

**Day3:** Arunachal\_Pradesh, Assam\_Meghalaya, Sub\_Himalayan\_WB, Uttarakhand, Himachal\_Pradesh, Coastal\_AP, Telangana, Rayalseema, TN\_Puducherry, SI\_Karnataka, Kerala,

**Day4:** Arunachal\_Pradesh, Assam\_Meghalaya, Sub\_Himalayan\_WB, Uttarakhand, Himachal\_Pradesh, Rayalseema, TN\_Puducherry, SI\_Karnataka, Kerala

**7. Spatial distribution of TTI: Daywise Sub-divisions with TTI >52:**

**Day0:** Arunachal\_Pradesh, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, West\_UP, Uttarakhand, Hry\_Chhd\_Delhi, Punjab, Himachal\_Pradesh, Jammu\_Kashmir, West\_RJ, Odisha, Coastal\_AP,

**Day1:** Arunachal\_Pradesh, Sub\_Himalayan\_WB, Bihar, East\_UP, West\_UP, Uttarakhand, Hry\_Chhd\_Delhi, Punjab, Himachal\_Pradesh, Jammu\_Kashmir, West\_RJ, East\_RJ, Guj\_Reg, Saurashtra\_Kutch, Coastal\_AP, Telangana,

**Day2:** Arunachal\_Pradesh, Sub\_Himalayan\_WB, West\_UP, Uttarakhand, Hry\_Chhd\_Delhi, Punjab, Himachal\_Pradesh, Jammu\_Kashmir, West\_RJ, Guj\_Reg, Saurashtra\_Kutch, Coastal\_AP, TN\_Puducherry,

**Day3:** Arunachal\_Pradesh, Sub\_Himalayan\_WB, Gangetic\_WB, East\_UP, West\_UP, Uttarakhand, Hry\_Chhd\_Delhi, Punjab, Himachal\_Pradesh, Jammu\_Kashmir, West\_RJ, East\_RJ, Odisha, Coastal\_AP,

**Day4:** Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Bihar, Uttarakhand, Himachal\_Pradesh, Jammu\_Kashmir, West\_RJ, Odisha, Saurashtra\_Kutch, Coastal\_AP, Telangana, TN\_Puducherry, NI\_Karnataka, SI\_Karnataka, Kerala,

**8. Rainfall : Daywise Sub-divisions with Precipitation >2cm:**

**Day1:** Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Gangetic\_WB, TN\_Puducherry, Kerala,

**Day2:** Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB,

**Day3:** Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Jammu\_Kashmir,

**Day4:** Arunachal\_Pradesh, Assam\_Meghalaya, Jammu\_Kashmir,

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

**1. Weather Systems:**

00 UTC analyses shows a low level trough starting from East Rajasthan and adjoining regions to coastal Orissa regions and this trough will persist for the next 2 days.

Another north-south oriented low level trough starting from Jharkhand and adjoining Gangetic West Bengal (GWB) regions to south coastal AP and adjoining regions and this trough will persist for the next 2-3 days.

Analyses also shows a low level CYCIR over NE India particularly over Nagaland and adjoining Manipur areas ; and another over Punjab and adjoining Pakistan regions, both of this CYCIR will persist for the next 2 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 3 days.

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

Analysis shows low level positive vorticity mainly over the foothills of Himalaya, along the west coast of India, east coast of India, east UP, Bihar, SHWB, Jharkhand, GWB and isolated pockets of NE states.

Forecast shows vorticity core zones mainly along the foothills of Himalaya, west coast of India, and isolated pockets of SHWB, GWB and NE states, Marathawada, north interior parts of Karnataka and few pockets along the east coast bordering Odisha and AP along with few regions of the north eastern states for the 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 Gangetic plains, Jharkhand, GWB, along the east of India and few pockets in NE India and along the west coast of India. Forecast shows significantly high threshold values over west coast of India, GWB and eastern coast for the next 3 days.

**Lifted Index (< -2):** The areas with index less than -2 lies along east coast regions, GWB, Odisha, coastal AP, and along the west coast of India and Kerala coast with gradually the above threshold value mainly extended towards southern coastal regions.

**Sweat Index (> 400):** 00UTC shows significant values over major parts along with the east coast extending up to coastal AP and also over west coast of India and few isolated pockets in the NE states. The significant zones are confined along east coast of India over GWB, Odisha, Bangladesh and adjoining regions and high value of SI observed over GWB and south AP coastal regions and NE region for next 3 days and also over few pockets in the south west region.

**Total Total Index (> 50):** Analysis shows significant values over few pockets in Gujarat, MP and adjoining areas. Above threshold value in most regions of central and western India and adjoining northern parts of India along with areas bordering north west India for the next 2-3 days.

**CAPE (> 1000):** Mostly along east coast of India over Gangetic plains, GWB, Odisha and adjoining AP regions along with parts in south peninsular region and coastal Kerala and Karnataka during the next 3 days.

**CINE (50-150):** Maximum CINE values are found in some areas of GWB and along east coast over Odisha, coastal AP and Tamil Nadu and also along the west coast of India for the next 2-3 days.

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

10-40 mm rainfall is forecasted tomorrow over most parts of the NE states ,particularly over Tripura, Manipur, Nagaland regions and some parts of J&K, HP, west Rajasthan, Punjab, Uttarakhand, SHWB, GWB, Orissa and adjoining north AP, Karnataka, north Tamilnadu and Kerala regions.

High to very high rainfall activity over NE states will continue for the next 3-4 days and light to moderate rainfall activity will continue over J&K, HP, GWB, SHWB, Kerala for the next 3 days.

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

##### **1. Model Reflectivity (Max.dBz): (>25 dBZ )**

Model reflectivity exceeding the threshold value, is forecasted over most parts of NE states, particularly over Tripura, Manipur and Nagaland regions some parts of J&K, HP, Uttarakhand, Gangetic plains, SHWB,GWB, coastal Orissa and adjoining AP and Kerala on day 1. Model reflectivity exceeding the threshold value are also forecasted over most parts of NE states, and some isolated pockets of J&K, Orissa, north AP ,Karnataka, north Tamilnadu and Kerala in the day-2 forecast

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

**Total Total Index (> 50)** Above threshold values is observed over most parts of NE India, along the east coast of India during next 24 hour.

**K-Index (> 35):** Above threshold values is observed over most parts of NE India ,J&K and over Kerala regions and parts of west coast of India during the next 24 hour.

**CAPE (> 1000):** Mostly along east coast of India over GWB, along the east coast and west coast of India during next 1-2 days. Another zone along west coast of India, particularly over coastal Kerala, coastal Karnataka and Konkan & Goa during next 2 days.

**CIN (50-150):** CIN values are mostly small all over coastal regions of India during all three days of forecasts except some areas over Odisha, GWB, Eastern UP, Bihar, Jharkhand, coastal AP, coastal Karnataka and Konkan-Goa during next 3 days.

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

Rainfall activity (~ 10-40 mm) is expected to persist till next 3 days over most parts of NE states, some parts of J&K,HP, Punjab, Uttarakhand , GWB, Kerala, Karnataka, north Tamilnadu and Heavy rainfall activity over NE states and light to moderate rainfall over Kerala will continue for the next 3 days

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

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

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

Presently, the upper air cyclonic circulation over Nagaland, Manipur, Mizoram & Tripura & neighbourhood extending upto 1.5 km above mean sea level persists which will give rise to heavy rainfall over the Assam, Meghalaya, Nagaland, Manipur, Mizoram and Tripura on Day-1. However intensity of the rainfall may decrease on Day-2.

The western disturbance as an upper air cyclonic circulation over north Pakistan & neighbourhood and extends upto 3.1 Km above mean sea level with a trough aloft runs roughly along longitude 66.0°E and north of latitude 22.0°N. This will give rise to the thunderstorm with hail activities over J&K, Himachal Pradesh and Uttarakhand on Day-1.

Uttar Pradesh and Bihar, Jharkhand will experience the thunder squall with gust wind activity on Day-1 due to the upper air cyclonic circulation over southwest Uttar Pradesh & neighbourhood and extends upto 0.9 Km above mean sea level.

The trough runs from the upper air cyclonic circulation over Jharkhand & neighbourhood to south Tamilnadu across interior Odisha and coastal Andhra Pradesh and extends upto 0.9 Km above mean sea level. This will give rise to thunder squall with gust wind activity over Andhra Pradesh, Telangana, Interior Tamilnadu and Kerala on Day-1.

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

Assam, Meghalaya, Nagaland, Manipur, Mizoram and Tripura, Arunachal Pradesh  
Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Punjab, Haryana and West and East UP  
Sub Himalayan West Bengal, Sikkim  
Kerala, Telangana, Rayalaseema, Coastal Andhra Pradesh, Interior Tamilnadu  
Orissa, Bihar, Jharkhand, South Chhattisgarh and GWB

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

Assam, Meghalaya, Nagaland, Manipur, Mizoram and Tripura  
Jammu and Kashmir, Himachal Pradesh, Uttarakhand and East UP  
Sub Himalayan West Bengal, Sikkim  
South Coastal Orissa, GWB

ForNCMRWFNWPproducts:(<http://www.ncmrwf.gov.in/HomePage/NEPS-prod-1.php>)

ForIMDNWPproducts:([http://nwp.imd.gov.in/diagpro\\_new.php](http://nwp.imd.gov.in/diagpro_new.php))

ForSynopticplotteddataandcharts

<http://amssdelhi.gov.in/>

<http://www.amsskolkata.gov.in/>

ForRAPIDtool:

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

LowLevelWinds

[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)

Upperlevelwinds

[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)

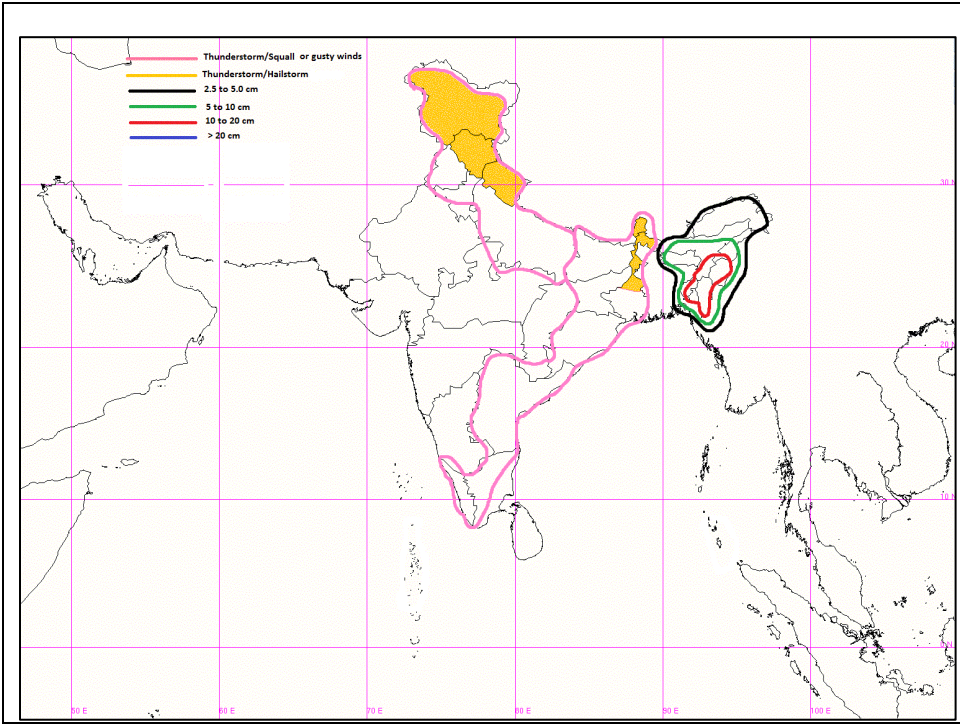
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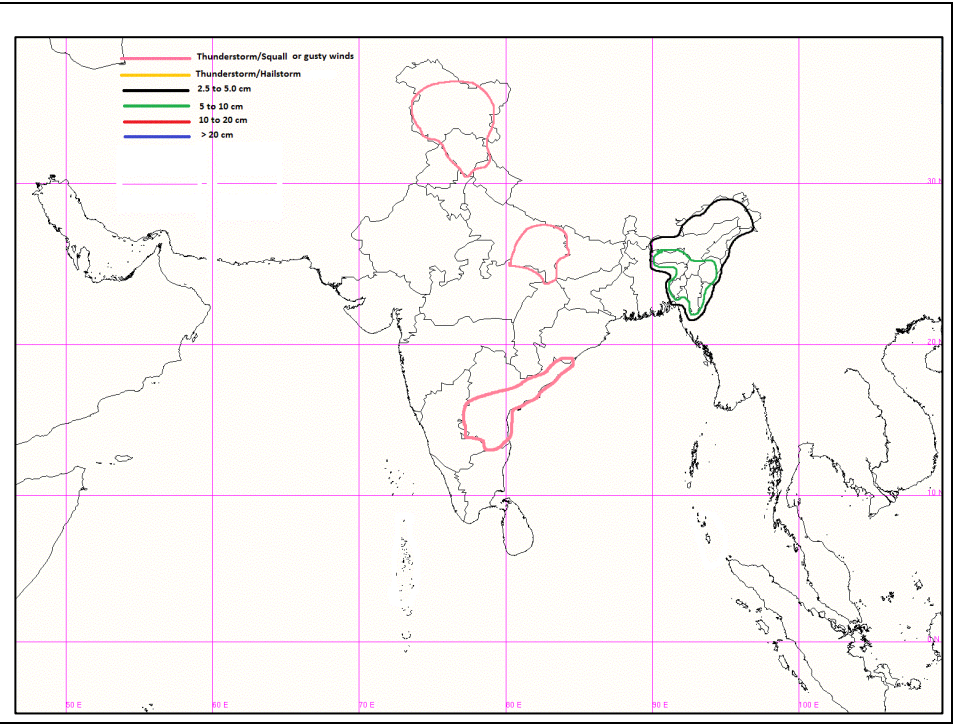
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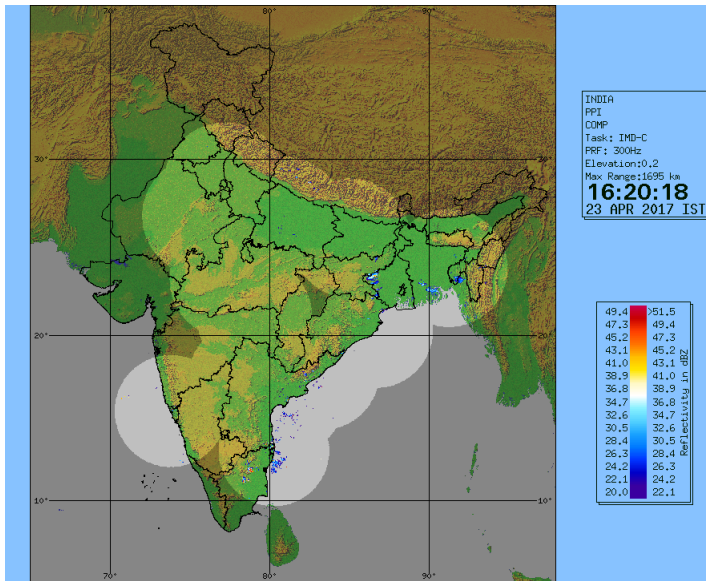


**IOP Advisory for 24hours**

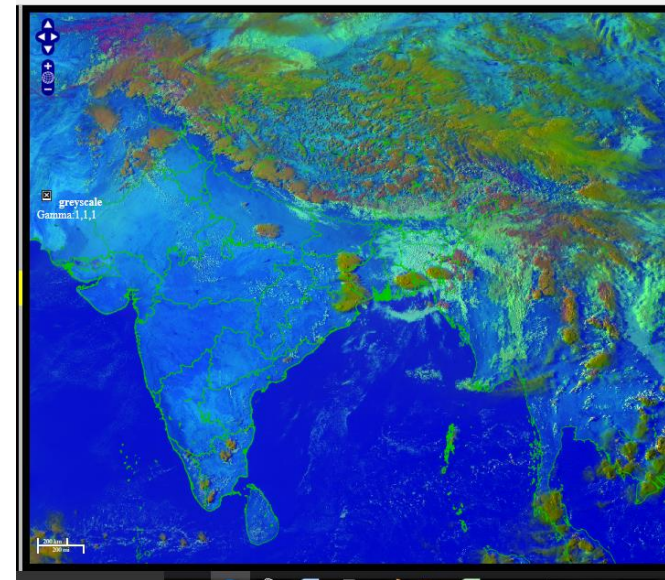


**IOP Advisory for 48hours**

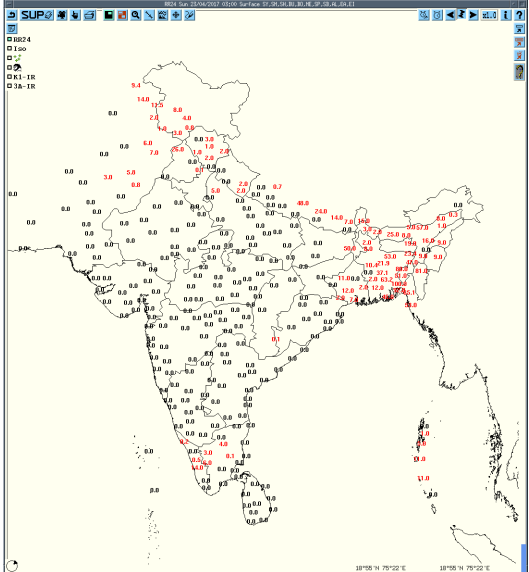
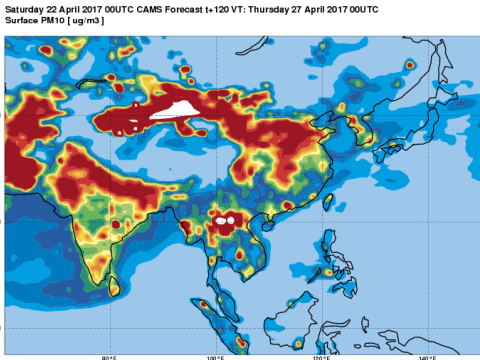
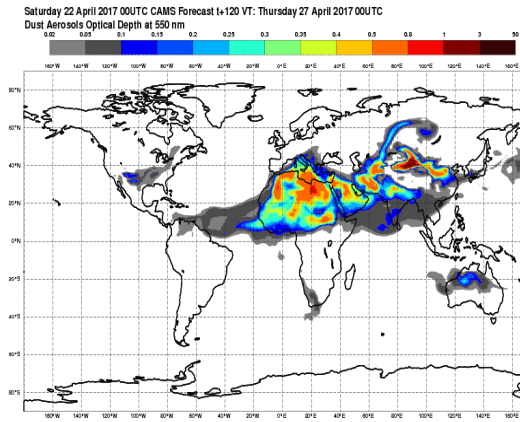




**DWR Composite at 1620hrs IST of today**



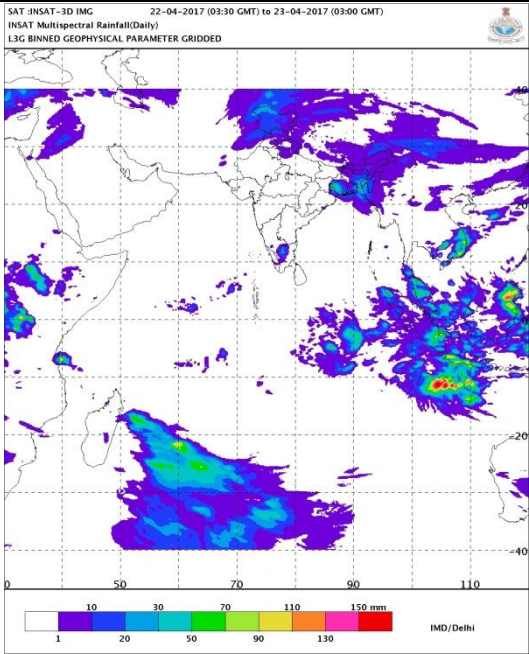
**RAPID RGB Image of INSAT 3D at 1530hrs IST of today**



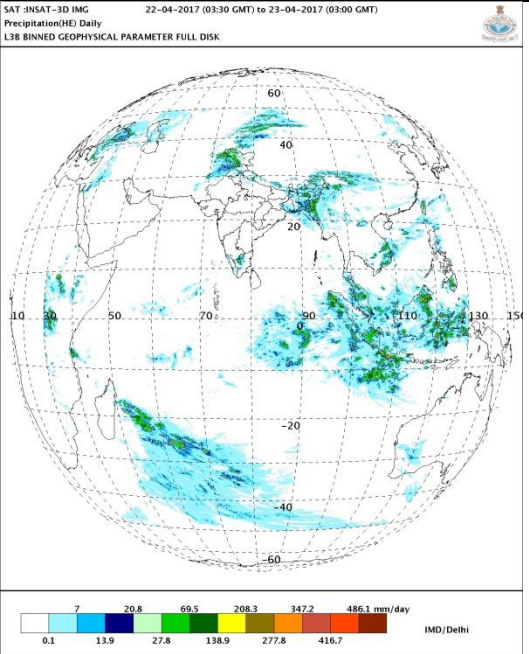
**Forecast Dust Concentration for 00UTC of 27<sup>th</sup> April**

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

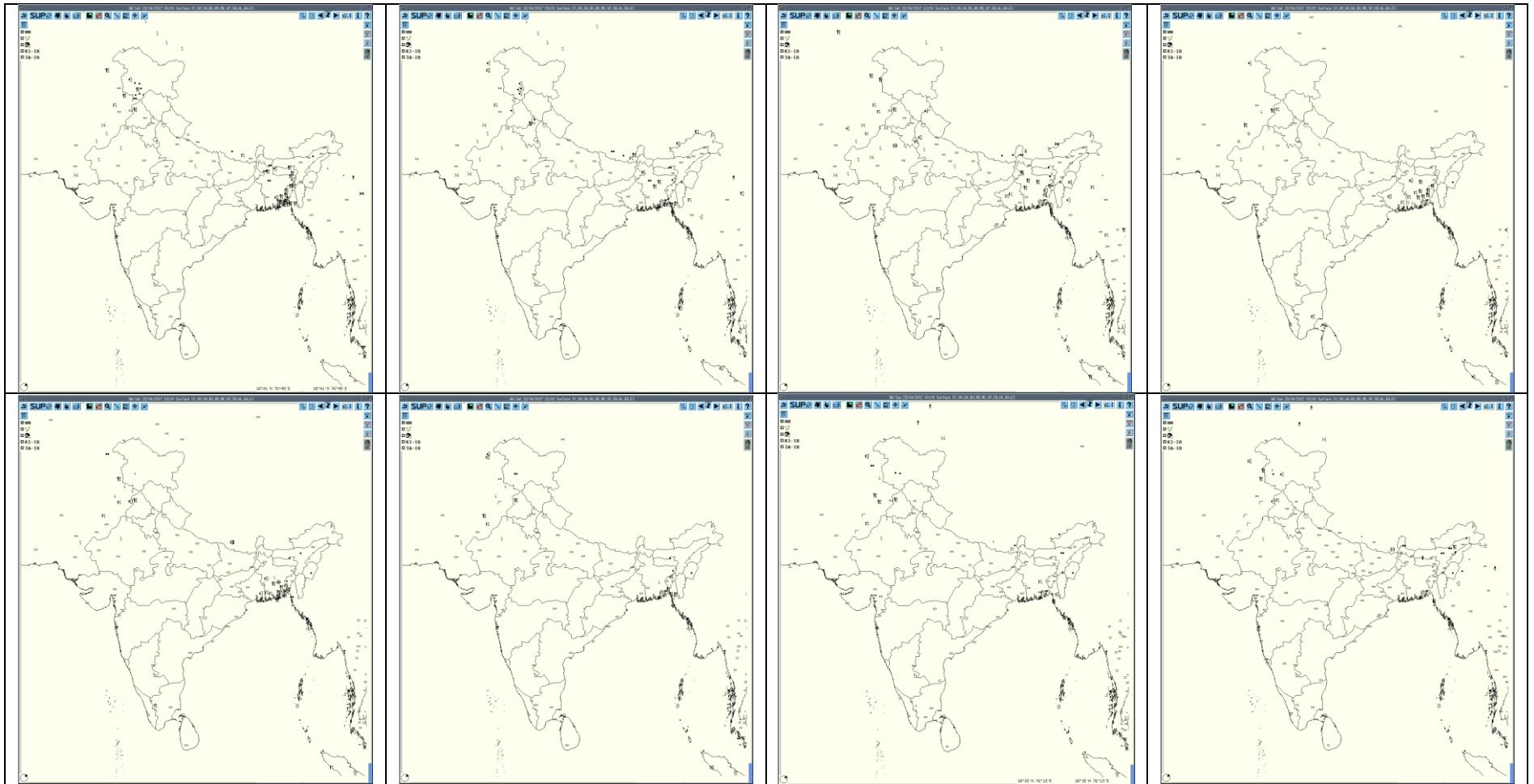
**Accumulated 24 Hour rainfall (in red) recorded at 0300 UTC of today**



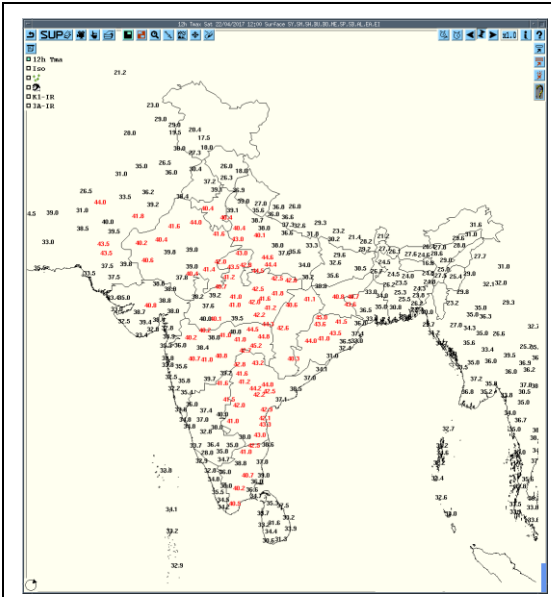
**IMR Rainfall**



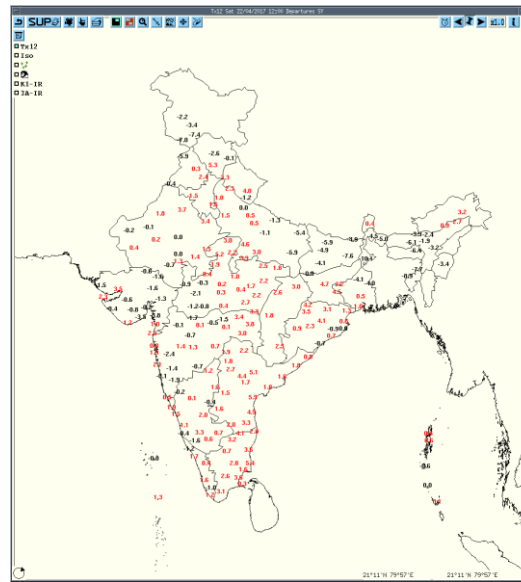
**HEM Rainfall**



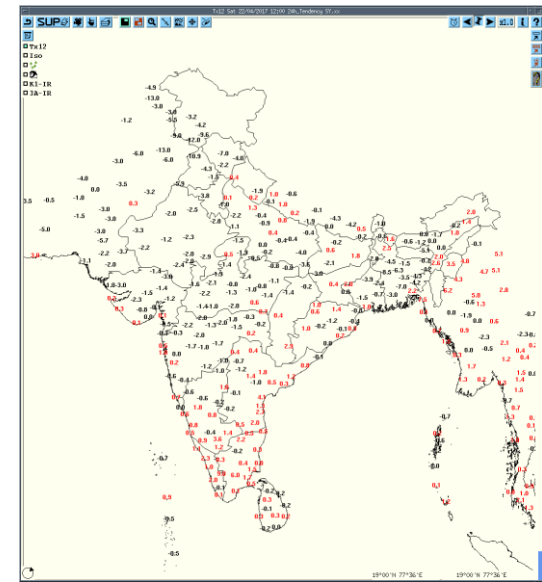
3 hourly Past weather at 06, 09, 12, 15, 18, 21 UTC of yesterday and 00 & 03 hrs UTC of today



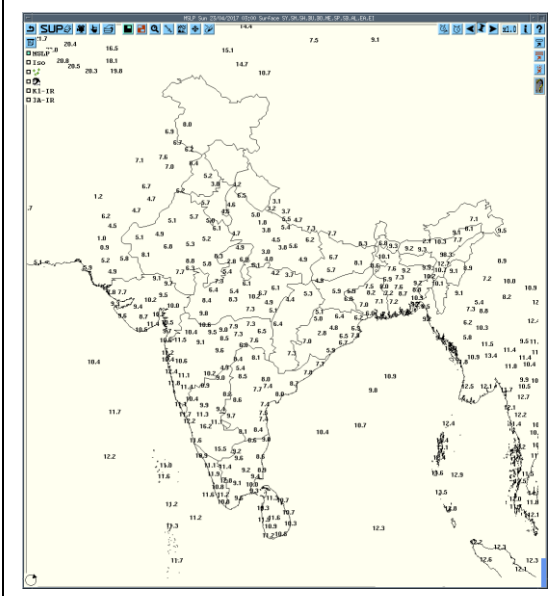
**Tmax**



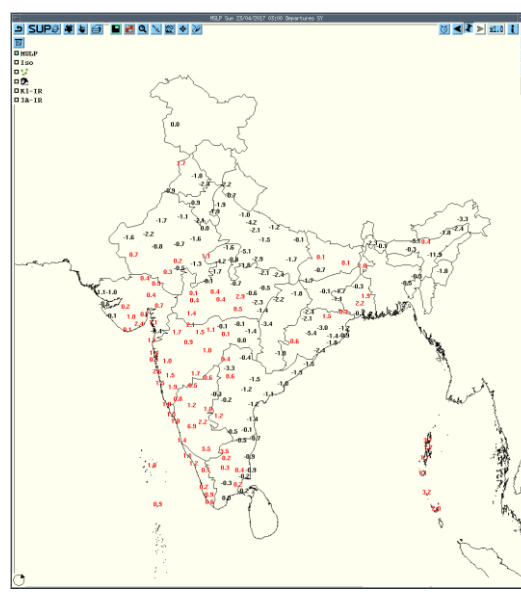
**Departure Tmax**



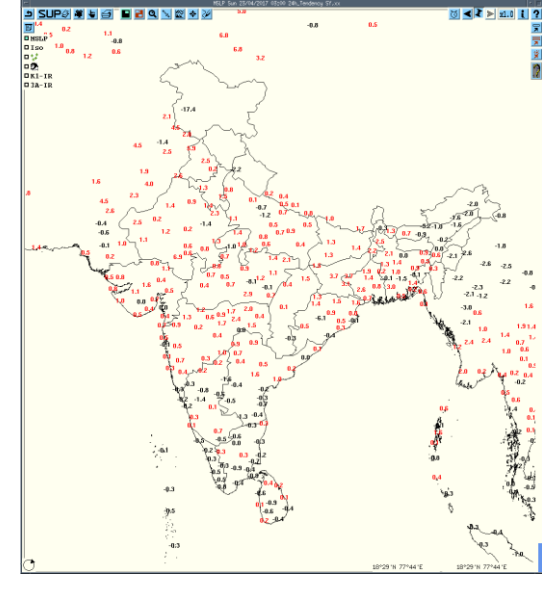
**Tendency Tmax**



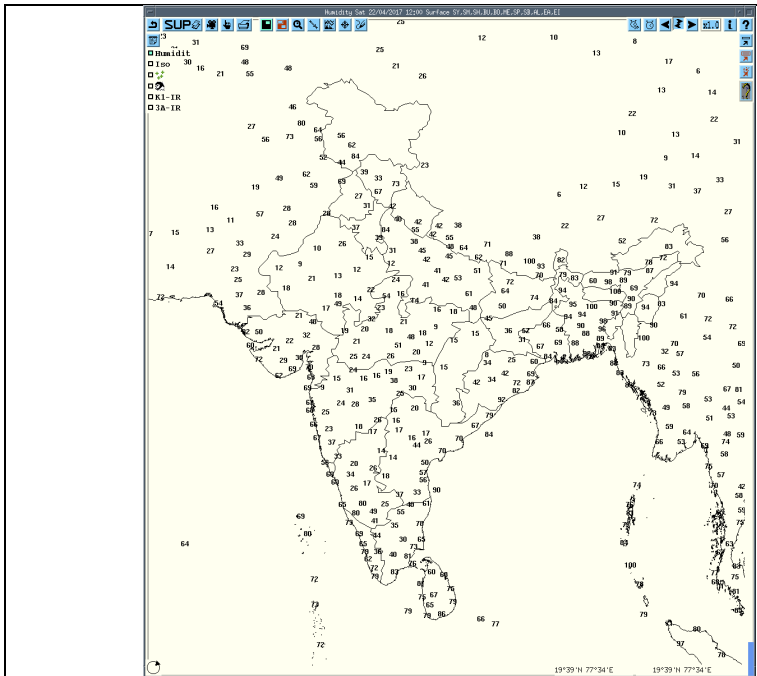
**MSLP**



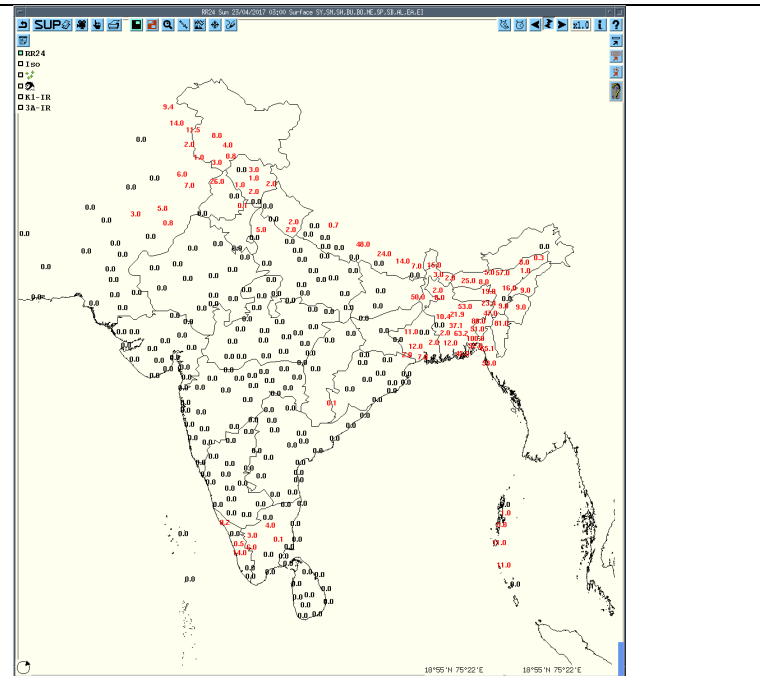
**Departure MSLP**



**Tendency MSLP**



RH at 12UTC yesterday



RH at 03UTC today



Realized weather past 24 hours (Based on SYNERGIE Products)					
Date	Time of Reporting	Name of Station Reporting	Region	STATE	Weather Event
22-04-17	0600 UTC	Banihal	Northwest India	J & K	Thunderstorm
		Amritsar	Northwest India	Punjab	Thunderstorm
		Guwahati	Northeast India	Assam	thunderstorm
		Shillong, Cherrapunjee	Northeast India	Meghalaya	Thunderstorm
		Agartala, Kailasahar	Northeast India	Tripura	thunderstorm
22-04-17	0900 UTC	Patiala	Northwest India	Punjab	Thunderstorm
22-04-17	1200 UTC	Amritsar	Northwest India	Punjab	Thunderstorm
		Churu	Northwest India	Rajasthan	Duststorm
		Palam, Safdarjung	Northwest India	Delhi	Thunderstorm
		Meerut	Northwest India	Uttar Pradesh	Thunderstorm
		Tirupati	South India	Andhra Pradesh	Thunderstorm
		Bankura, Panagarh	East India	West Bengal	Thunderstorm
		Imphal	Northeast India	Manipur	Thunderstorm
		Agartala	Northeast India	Tripura	Thunderstorm
22-04-17	1500 UTC	Amritsar	Northwest India	Punjab	Thunderstorm
		Bareilly	Northwest India	Uttar Pradesh	Lightening
		Tiruchirappalli	South India	Tamilnadu	Thunderstorm
		Cochin	South India	Kerala	<b>Thunderstorm with hail</b>
		Bankura, Kolkata (AP & City, Digha	East India	West Bengal	Thunderstorm
		Agartala	Northeast India	Tripura	Thunderstorm
22-04-17	1800 UTC	Coimbatore	South India	Tamilnadu	<b>Thunderstorm with hail</b>
		Amritsar	Northwest India	Punjab	Duststorm
		Kolkata City	East India	West Bengal	Thunderstorm
22-04-17	2100 UTC	Amritsar	Northwest India	Punjab	Thunderstorm
23-04-17	0000 UTC	Amritsar	Northwest India	Punjab	Thunderstorm
23-04-17	0300 UTC	North Lakhimpur	Northeast India	Assam	Thunderstorm
		Amritsar	Northwest India	Punjab	Thunderstorm
		Aizawl	Northeast India	Mizoram	Thunderstorm

**Realized TS/HS/SQ during past 24 hours ending at 0300UTC of today (received from RMCs/MCs)**

<b>Name of Station Reporting</b>	<b>Region</b>	<b>STATE</b>	<b>Weather Event (TS/Hail/Squall)</b>	<b>Date</b>	<b>Time of Commencement (IST)</b>	<b>Time of end (IST)</b>
Jagdalpur	East India	Jharkhand	Thunderstorm	22-04-17	1800	1900
Pantnagar	Northwest India	Uttarakhand	Thunderstorm	22-04-17	0845	0915
Mukteshwar	Northwest India	Uttarakhand	Thunderstorm	22-04-17	0830	0945
Meerut	Northwest India	Uttar Pradesh	Thunderstorm	22-04-17	1705	1740
			<b>Hailstorm</b>	<b>22-04-17</b>	<b>1655</b>	<b>1705</b>
Shimla	Northwest India	Himachal Pradesh	<b>Thunderstorm</b>	<b>22-04-17</b>	<b>1200</b>	<b>1235</b>
			<b>Hailstorm with hail diameter 1.0cm</b>	<b>22-04-17</b>	<b>1235</b>	<b>1240</b>
Patiala	Northwest India	Punjab	Thunderstorm	22-04-17	1350	1440
Amritsar	Northwest India	Punjab	Thunderstorm	22/23-04-17	221030 221705 230130 230825	221300 222400 230540 230830
Ludhiana	Northwest India	Punjab	Thunderstorm	22/23-04-17	1150	1400
Shillong	Northeast India	Meghalaya	Thunderstorm	22-04-17	0950	1210
N/Lakhimpur	Northeast India	Assam	Thunderstorm	23-04-17	0620	0830
Agartala	Northeast India	Tripura	Thunderstorm	22-04-17	0857	1240
					1455	1650
					1920	2205
Lengpui	Northeast India	Mizoram	Thunderstorm	22/23-04-17	1007	1535
					1735	2400
					230000	0535
					230645	230700
Kailasahar	Northeast India	Tripura	Thunderstorm	22-04-17	09900	1210
Barapani	Northeast India	Meghalaya	Thunderstorm	22-04-17	1010	1310
Cherrapunjee	Northeast India	Meghalaya	Thunderstorm	22-04-17	1047	1300

Guwahati	Northeast India	Assam	Thunderstorm	22-04-17	1050	1220
Silchar	Northeast India	Assam	Thunderstorm	22-04-17	1230	1300
Imphal	Northeast India	Manipur	Thunderstorm	22-04-17	1500	1710
Tadong	East India	Sikkim	Thunderstorm	22-04-17	1620	1625
Coochbehar	East India	West Bengal	Thunderstorm	22-04-17	840	930
Malda	East India	West Bengal	Thunderstorm	22-04-17	1500	1545
Alipore	East India	West Bengal	Thunderstorm	22-04-17	1950	2240
			<b>Squall from West Direction with max speed 76kmph</b>	<b>22-04-17</b>	<b>1950</b>	<b>1952</b>
			<b>Squall from Northwest Direction with max speed 54kmph</b>	<b>22-04-17</b>	<b>2012</b>	<b>2013</b>
			Lightening	22-04-17	1945	1950
Dum Dum		West Bengal	Thunderstorm	22-04-17	2015	2225
			Lightening	22-04-17	1915	2225
Haldia	East India	West Bengal	Thunderstorm	22-04-17	1915	2220
			<b>Squall from Northwest Direction with max speed 44kmph</b>	<b>22-04-17</b>	<b>1955</b>	<b>1956</b>
			Lightening	22-04-17	1905	1925
			Lightening	22-04-17	2220	2250
Digha	East India	West Bengal	Thunderstorm	22-04-17	1920	2000
			Lightening	22-04-17	1900	2330
Bankura	East India	West Bengal	Thunderstorm	22-04-17	1700	1940
			Lightening	22-04-17	1940	2010
Purnia	East India	Bihar	Thunderstorm	22-04-17	1228	1350
			Lightening	22-04-17	1228	1350

Agartala	Northeast India	Tripura	Thunderstorm	22-04-17	0857 1455 1920	1240 1650 2205
Kailasahar	Northeast India	Tripura	Thunderstorm	22-04-17	0900	1210
Dharmapuri	South India	Tamilnadu	Thunderstorm	22-04-17	1800	2100
Yercaud	South India	Tamilnadu	Thunderstorm	22-04-17	1800	1900
AMS Coimbatore	South India	Tamilnadu	Thunderstorm	22/23-04-17	222300 230358	230010 230515

### Past 24 hours DWR Report:

Radars Station name	Date	Time interval of observation (UTC)	Organization of the cells (Isolated single cells/multiple cells/ convective regions/ squall lines) with height of 20 dBZ echo top and maximum reflectivity	Formation w.r.t radar station and Direction of movement	Remarks	Associated severe weather if any	Districts affected
Nagpur	23-04-17	220252-230302	Nil				
Patiala	23-04-17	220000-220600	SUPER CELLS HT 11-12 MAX 53.0 dbz	FORMATION IN NW AND MOVEMENT SE WARDS	DWR U/S after 220600UTC for maintenance	TS/RA	BEHAT,DEOBAND,HA RDIWAR,DEHRADUN AND NEAR BY AREA
Karaikal	23-04-17	220300-230300			DWR U/S		
Hyderabad	23-04-17	220300-230300	Nil	Nil	Nil	Nil	Nil
Machilipatnam	23-04-17	220941-221111	Isolated single cell with average height of 8.5 km with maximum reflectivity of 54 dBZ	N (234KM) moving SE ly direction average speed of 3.6 kmph	Cells started forming at 0941UTC at N (234km) from radar. Maximum reflectivity during 1001 to 1041 and died down at 1111UTC	Possibility of Thunder storm with Rain and moderate winds.	Dantewara District

		221031-22 1201	Isolated single cell average height of 8 km with maximum reflectivity of 55.5dBZ	NE(212KM) moving SW ly direction average speed of 13.3kmph	Cells started forming at 1031UTC at NE (212km) from radar. Maximum reflectivity during 1051 to 1121 and died down at 1201 UTC	Possibility of Thunder storm and Rain with moderate winds.	Visakhapatnam District
Lucknow	23-04-17	220352-220442	Single isolated cell with average height of 14km and maximum reflectivity of 46 dBZ	NNW(250KM) moving in ESE'ly Direction at speed of 65km/hr	Single cell came under LKN Radar at 0352 UTC at NNW(250KM) did not intensified and dissipated at 0452 UTC at NNW(200KM) from RADAR	NIL	Pilibhit
		221402-221442	Single cell with average height of 14 km and Maximum reflectivity of 46 dBZ	NW(250KM) moving in SE'ly direction at speed of 65km/hr	Single cell came under LKN Radar at 1402 UTC at NW(250KM) moved inSE'ly direction did not intensified and dissipated at 1432 UTC at NW(225KM) from RADAR	NIL	Badaun,Bareilly
		221502-221602	Single cell with average height of 14 Km and maximum reflectivity 46 dBZ	WNW(250KM) moving in SE'ly direction at speed of 43 km/hr	Single cell came under LKN Radar at 1502 UTC at about WNW(250KM) did not intensified and dissipated at 1552 UTC at WNW(200KM) from RADAR	NIL	Badaun
		221632-221652	Single Isolated cell with average height of 12 km and maximum reflectivity of 34 dBZ	NW (200KM) moving in E'ly direction at speed of 22km/hr	Single isolated cell started forming at 1622 UTC at NW(200KM) did not intensified and dissipated at 1652 UTC at NW(195KM) from radar	NIL	NIL
		221732-221822	Single Isolated cell with average height of 13km	NNW(175KM) moving in ESE'ly direction at speed	Single cell started forming at 1732 UTC at NNW (180KM)	NIL	Lakhimpur Kheri



			and Maximum reflectivity of 46 dBZ	of 86km/hr	intensified at 1752 UTC at NNW(170KM) and dissipated at 1822 UTC at N(160KM) from radar		
Agartala	23-04-17	220300-221000	A line Structure of cells with Maximum Height 14km and maximum reflectivity 42 dBZ (at 0450 UTC of 22.04.17 over South Bangladesh-160km SSW of DWR AGT)	Formed 300 km NW of DWR AGT at 1700 UTC of 21.04.17 and moved ESE-wards at around 70kmph	Cells Dissipated at 1000 UTC of 22.04.17 over Mizoram	TS with rain	All Districts of Tripura, East Khasi District of Meghalaya, Mamit District of Mizoram
		220620-221520	Multiple Cells with Maximum Height 10 km and maximum reflectivity 35 dBZ (at 0820 UTC over Bangladesh-130km NW of DWR AGT)	Formed 290 km NW of DWR AGT at 0620 UTC of 22.04.17 and moved SE-wards at around 55 kmph	Cells Dissipated at 1520 UTC of 22.04.17 over Manipur	TS with rain	West, Sipahijala, Gomati, Khowai, North, Dhalai, Unakoti districts of Tripura
		220820-222300	A squall line with Maximum Height 14 km and maximum reflectivity 42dBZ (at 1430 UTC over Sipahijala District of Tripura)	Formed 430 km NW of DWR AGT at 0820 UTC of 22.04.17 and moved SE-wards at around 60kmph	Cells Dissipated at 2300 UTC of 22.04.17 over Manipur	TS with rain	All Districts of Tripura, Imphal East and West district of Manipur, Mamit District of Mizoram
		221520-221940	Multiple Cells with Maximum Height 14 km and maximum reflectivity 40 dBZ (at 1700 UTC over Bangladesh-180km West of DWR AGT)	Formed 250 km WNW of DWR AGT at 1520 UTC of 22.04.17 and moved ESE-wards at around 50 kmph	Cells merged with the above system at 1940 UTC of 22.04.17	TS with rain	All Districts of Tripura

		222200-230230	Multiple Cells with Maximum Height 10 km and maximum reflectivity 42 dBZ (at 0020 UTC over Bangladesh-100km SW of DWR AGT)	Formed 170 km West of DWR AGT at 2200 UTC of 22.04.17 and moved SE-wards at around 55kmph	Cells Dissipated at 0230 UTC of 22.04.17 over South Bangladesh	N/A	N/A
Vishakhapatnam	23-04-17	220300-220600	NIL	NIL	NIL	-	⚡
		220600-220900	A single cell in the NE at 173kms with max reflectivity 45dbz with height 4kms.	-	-	-	⚡
		220900-221200	Well organized cell in the NE at 209kms with max reflectivity 64dbz and height 14kms. Another convective region in WEST with reflectivity 40dbz and at 119kms.other convective region in SE 114kms with max reflectivity 40 dbz and height 5kms.	Moving SE ly and dissipated at 12.01 UTC. - -	-	-	⚡
		221200-221500	Convective region of max reflectivity 50dbz at 118kms in SE with height 4kms.	Moving SE ly	Convective region to form as a cell and dissipates .	-	⚡
		221500-221800	Convective region at 188kms from radar with Max reflectivity44dbz in the SE and height 5kms.	SE ly	-	-	⚡

		221800-230000	Convective region at 180kms from radar with Max reflectivity 40dbz in the SW and height 4kms.	SW ly	-	-	!
		230000-230300	NIL	NIL	-	-	!
Kolkata	23-04-17	220632 -2220652	NIL	NIL	NO SIGNIFICANT ECHO	NIL	NIL
		220701 - 221851	Cluster of isolated single cells merged to form extended multi celled system with maximum reflectivity of 63.0	ENE (147 km) To ESE (169 km). Moving in SE-ly direction with a speed of 34.9 kmph.	Formation started at 0701 UTC in between ENE (147 km) and ESE (169 km) from Radar. Matured and moved out of Radar range at 1051 UTC.	Hailstorm /Thunderstorm /Squall / Rain	N/A
			1.Isolated single cells with maximum reflectivity of 66.5dBz at 1241 UTC and maximum height of 15.7 Km at 1231 UTC.	1.W (234 km) moving in SE-ly direction with a speed of 36 kmph.	1.Formation started at 0912 UTC of in W at a distance of 234 km from Radar. Merged to a single cell Matured and merged with 2.at 1351 UTC	Hailstorm /Thunderstorm /Squall / Rain	N/A
			2.Initially single cell which developed in line squall with maximum reflectivity of 69.0 dBz at 1031 UTC and height more than 18 Km between 1112 and 1351UTC.	2.NW (248 km) moving in SE-ly direction with a speed of 61 kmph.	2.First observed at 0951 UTC in NW at a distance of 248 km from Radar. Matured single cell and developed in extended multi celled system at 1221 UTC. Formation of line squall at 1422. Dissipated at 1851 in SE at a distance 131.5 km from radar	Hailstorm /Thunderstorm /Squall / Rain	N/A

			3. Single cell with maximum reflectivity of 67.0 dBz at 1011 UTC and maximum height 14.6 km at 1011 UTC.	3. NW (247 km) moving in SE-ly direction with a speed of 52.2 kmph.	3. First observed at 1011 UTC in NW at a distance of 247 km from Radar. Matured single cell. Dissipated at 1131 UTC in NW at a distance of 197 km from Radar.	Hailstorm /Thunderstorm /Squall / Rain	N/A
			4. Extended multi celled system with maximum reflectivity of 60.5 dBz at 1241 UTC and maximum height of 16.6 Km at	4. N (241 km) moving in ESE-ly direction with a speed of 43.6 kmph.	4. First observed at 1031 UTC in N at a distance of 241 km from Radar. Matured. Merged with 2. at 1652 UTC.	Hailstorm /Thunderstorm /Squall / Rain	N/A
			5. Extended multi celled system with maximum reflectivity of 63.0 dBz at 1731 UTC and maximum height of 15.1 Km at	5. NNE (205 km) moving in ESE-ly direction with a speed of 71.6 kmph.	5. Multi-celled system developed at 1521 UTC in NNE at a distance of 241 km from Radar. Matured. Moved out of radar range at 1851 UTC in ENE-ly direction	Hailstorm /Thunderstorm /Squall / Rain	N/A
		221901 - 222211	NIL	NIL	NO SIGNIFICANT ECHO	NIL	NIL
		222221 - 230041	Single cells with maximum reflectivity of 59.0 dBz at 0021 UTC and maximum height 09.59 km at 0002 UTC.	NE (192.8 km) moving in ESE-ly direction	Isolated single cells developed at 2221 UTC in NE(192.8 km)Not matured. Dissipated at 0041 UTC in ENE at a distance 223.2 km from radar.	Thunderstorm /Squall / Rain	N/A
		230052 - 230301	NIL	NIL	NO SIGNIFICANT ECHO	NIL	NIL
Patna	23-04-17	220300-220800	NIL	NIL	N/A	N/A	N/A

		220800-220900	Multiple Cell. Maximum Reflectivity : 35 dBZ Echo Top : 10.6 KM	Range: 230 KM from DWR Patna in East-North- East dirction. Movement- Easterly	Warning E-mail sent to State Disaster management Authority and Concern DMs	THUNDER- STORM WITH RAIN	PURNIA, ARARIA, KISHANGANJ
		220900-230300	NIL	NIL	N/A	N/A	N/A



Paradeep	23-04-17	220600-221000	Isolated less convective cells observed forming after 1202 IST with average height of 07 km(max height of 10km) & max. reflectivity 35 dBZ. The Cells weakened gradually.	Position: Lat.: -20.6 deg.N Long: -85.6deg.E Range: -Around 70 km to 150km. Movement- towards south-east direction.	NIL.	Slight TS with rain	Isolated places in Boudh, Balangir, Angull, Dhenkanal, Kandhamal, kalahandi, Nayagarh, Rayagada, Gajapati districts.
		221000-221200	Isolated convective cell observed forming after 1540 IST with average height of 07 km(max height of 12km) & max. reflectivity 42 dBZ. The Cells weakened gradually.	Position: Lat.: -19.4 deg.N Long: -84.4deg.E Range: -Around 200 km to 250km. Movement- towards south-south-east direction .		TS with Rain	Ganjam
		221100-221900	Isolated convective cell observed forming after 1712IST with average height of 08 km(max height of 14km) & max. reflectivity 48 dBZ. The Cells	Position: Lat.: -22.21 deg.N Long: -86.3deg.E Range: -Around 220 km. Movement- towards south-east direction .		TS with Rain	Mayurbhanj & Balasore

∞	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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