



## **India Meteorological Department**

### **FDP STORM Bulletin No. 17 (23-03-2018)**

#### **1. CURRENT SYNOPTIC SITUATION:**

##### **NWFC INFERENCE (0300UTC of the Day):**

- ◆ The Western Disturbance as an upper air cyclonic circulation over northeastern parts of Jammu & Kashmir and neighbourhood has moved away east northeast wards.
- ◆ A fresh feeble Western disturbance as a trough in mid & upper tropospheric westerlies runs with its axis at 5.8 km above mean sea level roughly along Long 65 °E to the north of Lat 37 °N.
- ◆ A cyclonic circulation between 1.5 and 3.1 km above mean sea level lies over Haryana and adjoining areas of West Uttar Pradesh & north Rajasthan.
- ◆ The core of sub-tropical westerly jet stream runs between Lat. 23 °N and 25 °N at 9.5 km above mean sea level over the Indian region.
- ◆ A cyclonic circulation lies over Sub Himalayan West Bengal and neighbourhood and extends upto 0.9 km above mean sea level.
- ◆ The trough extending upto 0.9 km above mean sea level from Bihar to interior Tamilnadu now runs from above system to south Tamilnadu across western parts of Gangetic West Bengal, Odisha, Coastal Andhra Pradesh and Rayalaseema.
- ◆ The cyclonic circulation extending between 1.5 & 2.1 km above mean sea level over southwest Bay of Bengal off Sri Lanka Coast persists.

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

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

##### **Western Disturbance (WD):**

Broken multi-layered clouds seen over Jammu & Kashmir, Central China and Tibet in association with WD over the area.

Broken multi-layered clouds with embedded intense convection seen over Caspian Sea & neighbourhood Northeast Iran in association with WD over the area.

**Clouds description within India:**

Scattered low/medium clouds were seen over North Himachal Pradesh, North Uttarakhand, Gangetic West Bengal, Central Kerala and adjoining Tamilnadu. Scattered low/medium clouds with embedded isolated weak to moderate convection seen over Assam and Arunachal Pradesh. Isolated low/medium clouds were seen over Sikkim, East Meghalaya, Coastal Andhra Pradesh,

**Arabian Sea:** Isolated low/medium clouds with embedded weak to moderate convection seen over Southwest Arabian Sea.

**Bay of Bengal & Andaman Sea:** Isolated low/medium clouds were seen over Southeast Bay and Nicobar Islands.

**Past Weather:****Convection (during last 24 hrs):**

Weak to moderate convection was observed over J&K Himachal Pradesh Uttarakhand Sikkim Arunachal Pradesh Nagaland Kerala Tamilnadu Andhra Pradesh.

**OLR:**

Upto  $230 \text{ w m}^{-2}$  was observed over J & K, North Himachal Pradesh, North Uttarakhand, Sikkim, Arunachal Pradesh, Manipur, Gangetic West Bengal, Kerala and Coastal Andhra Pradesh.

**Dynamic Features:**

Negative shear tendency is observed over Arunachal Pradesh & N/Hood and Positive shear tendency over rest parts of India.

Medium to high wind shear is observed over North & Central India and low wind shear over South Peninsula region.

A positive Vorticity field is observed over Gangetic West Bengal.

Negative low level convergence is observed over Maharashtra, Madhya Pradesh, Gujarat and Positive Low Level Convergence over rest parts of India.

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

Rainfall upto 50-70 mm observed over north East J & K.

10-20mm: rest north east J & K rest north Kerala.

0-10mm: rest J & K, North Himachal Pradesh Uttarakhand, North and East Uttar Pradesh, North Sikkim, Arunachal Pradesh, rest North Kerala and North West Tamilnadu.

**HEM:**

Rainfall upto 7mm observed over South Himachal Pradesh North Uttarakhand, Arunachal Pradesh, West Assam north Kerala north west Tamilnadu.

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

Isolated light echoes are seen as seen on DWR Agartala, Srinagar and Thiruvananthapuram at around 1300 IST.  
RAPID RGB Satellite imagery at 1530IST indicates no significant convection over India

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

Higher Dust concentration was observed over Arab countries and northern part of Africa. Dust concentration is expected to decrease over north-western part of India for next five days. PM10 concentration is expected to increase over IGP in next five days. Particulate matter concentration is expected to remain in moderate to poor category for next 2 days in Delhi.

<b>Delhi – SAFAR analysis &amp; Forecast</b>	23.03.2018	24.03.2018
PM10 (micro-g/m <sup>3</sup> )	203	196
PM2.5 (micro-g/m <sup>3</sup> )	113	100

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

### **NCMRWF (NCUM forecast based on 000UTC of the day):**

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

##### **Low level CYCIRS, Troughs:**

**12 UTC of Day 0-4:** 850 hPa trough over Bangladesh and adjoining parts of NE India moving eastwards

**00 UTC of Day 1-3:** 850 hPa NE-SW feeble trough from Bihar to Andhra Pradesh

##### **Confluence & Wind Discontinuity Regions:**

**12 UTC of Day 1-3:** at 850 hPa SW-NE wind discontinuity over east coast of India

##### **Synoptic Systems:**

**12 UTC of Day 1-2:** At 500 hPa WD and associated cyclonic circulation over Punjab and adjoin areas of J & K, HP

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

**12 UTC of Day 0-4:** Weaker core in all the days except in Day 3 and 4 over eastern India

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

##### **Day/Index: Subdivisions with Lower Level Convergence > 15 x 10<sup>-5</sup> /s**

Day0: Arunachal Pradesh, Jharkhand, Odisha, Coastal Andhra Pradesh, Tamilnadu, Puducherry, SI Karnataka,

Day1: Jharkhand, Odisha, East MP, Madhya Maharashtra, Coastal Andhra Pradesh, Telangana, Coastal Karnataka, SI Karnataka, Kerala,

Day2: NE NMMT, Odisha, Madhya Maharashtra, Coastal Andhra Pradesh, Coastal Karnataka, SI Karnataka, Kerala,

Day3: Assam Meghalaya, Odisha, Madhya Maharashtra, Chhattisgarh, Coastal Andhra Pradesh, Coastal Karnataka, SI Karnataka, Kerala,

Day4: NE NMMT, Odisha, Madhya Maharashtra, Marathwada, Coastal Andhra Pradesh, Tamilnadu, Puducherry, NI Karnataka, SI Karnataka, Kerala,

#### 4. Low level Vorticity:-Positive Vorticity:

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

Day0: Assam Meghalaya, Jharkhand, Coastal Andhra Pradesh,

Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Himachal Pradesh, Odisha,

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Himachal Pradesh, Jammu Kashmir, Odisha, SI Karnataka, Kerala,

Day3: Assam Meghalaya, Gangetic WB, Uttarakhand, Himachal Pradesh, Odisha, Coastal Andhra Pradesh, Coastal Karnataka, SI Karnataka, Kerala,

Day4: NE NMMT, Jammu Kashmir, Odisha, Madhya Maharashtra, Coastal Andhra Pradesh,

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

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

Day0: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Tamilnadu, Puducherry, Kerala,

Day1: Arunachal Pradesh, Sub Himalayan WB, Himachal Pradesh,

Day2: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Haryana, Chandigarh, Delhi, Himachal Pradesh,

Day3: Arunachal Pradesh, NE NMMT, Sub Himalayan WB,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Uttarakhand, Konkan Goa, Madhya Maharashtra, Tamilnadu, Puducherry, NI Karnataka, Kerala,

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

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

Day0: Gangetic WB, Coastal Andhra Pradesh, Rayalaseema, Tamilnadu, Puducherry, Kerala,

Day1: Arunachal Pradesh, Sub Himalayan WB, Telangana, Coastal Karnataka, SI Karnataka, Kerala,

Day2: Arunachal Pradesh, Sub Himalayan WB, Coastal Andhra Pradesh,

Day3: Arunachal Pradesh, NE NMMT, Sub Himalayan WB,

Day4: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Konkan Goa, Madhya Maharashtra, Tamilnadu, Puducherry, Kerala,

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

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

Day0: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir,

Day1: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ,

Day2: Arunachal Pradesh, Sub Himalayan WB, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West RJ,

Day3: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Uttarakhand,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Konkan Goa, Madhya Maharashtra, NI Karnataka,

## 8. Rainfall and thunder storm activity:

### Day/Index: Subdivisions with Precipitation > 2 cm

Day1: Arunachal Pradesh, Assam Meghalaya,

Day2: Arunachal Pradesh, Assam Meghalaya,

Day3: Arunachal Pradesh, Assam Meghalaya,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT,

Day5:

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

#### 1. Synoptic Systems:

The analysis based on 00 UTC shows a cyclonic circulation in lower troposphere over Haryana and adjoining areas and one feeble cyclonic circulation over west Uttar Pradesh and adjoining area. Analysis also shows a trough extends from south Andhra Pradesh to south Tamil Nadu. Forecast shows the cyclonic circulation over Punjab moves eastward and lies over Uttarakhand and adjoining west Uttar Pradesh on day 1 and becomes less marked thereafter. An East-West trough runs from Sikkim to Nagaland. Another cyclonic circulation lies over Telangana and adjoining areas and a trough extends from this cyclonic circulation to extreme south peninsula during next 24 hours.

#### 2. Location of Jet and Jet Core (>60kt) at 500hPa:

Although the presence of strong westerlies is found but no jet core over the Indian region for the next 2 days.

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

Mostly along the north eastern states on all 3 days and along the trough from Telangana region to extreme south peninsular India on all 3 days; over east Uttar Pradesh and adjoining area, parts of central India up to Telangana.

#### 4. Spatial distribution of T-storm Initiation Index, Lifted Index, Total Total Index, CAPE, CIN and Sweat Index [High potential for thunderstorm]:

**T-Storm Initiation Index (> 3):** Higher than a value 3 over parts of Gangetic West Bengal, Orissa, Andhra Pradesh, Telangana, Kerala, Karnataka, Tamil Nadu, coastal Maharashtra, Konkan & Goa, coastal areas along the east coast and west coast extreme south peninsular India on all 3 days. Maximum value of index is seen along the east coast GWB and adjoining coastal Orissa, Andhra Pradesh and Tamil Nadu during all 3 days and along the west coast on day 3.

**Lifted Index (< -2):** The threshold value of the is below -2 over parts of Gujarat, southern part of west coast, coastal areas along the east coast, coastal Orissa, Andhra Pradesh, coastal Karnataka, Kerala and Tamil Nadu, GWB, Tripura and adjoining area, Konkan and Goa on all 3 days; some parts of Bihar, Jharkhand and east Uttar Pradesh on day 1; maximum negative value of the index can be seen over coastal area along east coast and southern part of west coast, GWB, Orissa, Kerala, Andhra Pradesh and Tamil Nadu during all 3 days.

**Total Total Index (> 50):** Above threshold value over parts Chhattisgarh, East Madhya Pradesh adjoining East Uttar Pradesh, Madhya Maharashtra, Marathwada, Vidarbha and coastal Maharashtra on day 1; over parts of East Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, Orissa, Andhra Pradesh, Karnataka, Telangana, coastal Maharashtra, Madhya Maharashtra and Marathwada and Vidarbha on day 2 and 3; on day 3 over some parts of Gujarat and GWB.

**Sweat Index (> 300):** Parts of Gujarat, NE states, GWB, Peninsular India, Konkan & Goa, Bihar, Jharkhand, Orissa, J&K and Himachal Pradesh, Uttarakhand coastal areas of south and east coast during all 3 days. Over parts of Punjab, Haryana, Uttar Pradesh and East Madhya Pradesh on day 1; Maximum value of the index can be seen over GWB adjoining Jharkhand, coastal Orissa and adjoining area on day 2 and 3.

**CAPE (> 1000):** Mostly along coastal areas of southern peninsular India along west coast and over east coast and coastal areas of GWB and adjoining Bihar, Jharkhand and Orissa and Andhra Pradesh and some parts of Gujarat during all 3 days. Maximum value can be seen on day 1 and 2 over coastal Orissa and GWB.

**CIN (50-150):** Mostly over parts of Gujarat, along east coast along west coast from Saurashtra & Kutch to coastal Karnataka, Konkan and Goa, coastal Orissa, Telangana, Rayalaseema, Andhra Pradesh and GWB and NE states, Bihar, Jharkhand and adjoining area during all 3 days. Over parts of Punjab, Haryana, North west Rajasthan, East Uttar Pradesh and Madhya Pradesh on day 1. Maximum value of the index is seen over northern parts of coastal Maharashtra on day 2.

### **5. Rainfall Activity:**

10- 40 mm rainfall: On day 1 over parts of Himachal Pradesh, Arunachal Pradesh and adjoining area and Kerala; on day 2 over parts of Arunachal Pradesh and adjoining area and Kerala.

Up to 10 mm rainfall: Over parts of J&K, Uttarakhand, Foothills of Himalaya, NE states, GWB, south Peninsular India particularly over Kerala and adjoining areas during all 3 days.

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

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

**> 25 dBZ Model Reflectivity:** > 25 dBZ Model Reflectivity: observed over parts of Himachal Pradesh, Arunachal Pradesh and adjoining area; over parts of Assam, Meghalaya, Tripura, Mizoram, Arunachal Pradesh and adjoining area during the next 2 days.

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

**Total Total Index (> 50):** Above threshold value is observed over most parts of the country except south peninsula, along east and west coast and north-eastern states, Gujarat and North west Rajasthan on day 1; On day 2 above threshold value are observed over most parts of the country except south peninsula, along east and west coast and some parts of Gujarat and NE states and on day 3 over south Peninsular India, coastal areas of east coast, southern part of west coast and NE states; The maximum values are found over North west Rajasthan and J&K on day 3; over Jharkhand, East Madhya Pradesh, Chhattisgarh and adjoining Orissa on day 1.

**K-Index (> 35):** Less than threshold value is observed over the country during the next 3 days except over parts Karnataka, southern Peninsular India, Andhra Pradesh, Karnataka, Orissa and adjoining area and NE states.

**CAPE (> 1000):** Greater than threshold value over J&K, Gujarat, coastal areas of southern part of west coast, coastal areas along the east coast, coastal Orissa, GWB, Assam and adjoining areas, parts of Tamil Nadu, Kerala, Andhra Pradesh on day 1 and 2. On day 3 over parts of Punjab, Haryana, North West Rajasthan and some parts of Himachal Pradesh Bihar Jharkhand, Orissa, GWB, NE states, coastal areas of the east coast and southern part of west coast, Konkan and Goa. Maximum value greater than 3000 is seen over the parts of Orissa and its coastal areas and coastal Tamil Nadu on day 1; over coastal Orissa, GWB, extreme southern part of west coast, coastal and Tamil Nadu; along the southern part of west coast on day 2.

**CIN (50-150):** Over most of the parts of Gujarat, Saurashtra region, Rajasthan, J & K, Punjab, Himachal Pradesh, Uttarakhand, Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Orissa, coastal areas along east coast and west coast, Konkan and Goa, southern parts of peninsular India, GWB and NE states during all 3 days . Maximum value of the index is seen over coastal Andhra Pradesh, some parts of Jharkhand, Orissa on day 1; over some parts of Gujarat, Orissa, GWB & Kolkata on day 2; on day 3 over some parts of Gujarat, some parts of west Rajasthan, northern parts of Coastal Maharashtra and some parts of Orissa.

### **3. Rainfall and Thunderstorm Activity:**

70 -130 mm rainfall: Over some parts of Arunachal Pradesh on day 1.

40 -70mm rainfall: Over some parts of Arunachal Pradesh during next 2 days.

10- 40 mm rainfall: Over parts of Kerala, J & K, Arunachal Pradesh, Assam, Meghalaya, Tripura and adjoining area during all 3 days; over parts of Tamil Nadu on day 1 and 2; over parts of Himachal Pradesh and Uttarakhand on day 1.

Up to 10 mm rainfall: Over parts of J & K, Himachal Pradesh, Uttarakhand, NE states, places along Foothills of Himalaya, parts of Orissa, Jharkhand, GWB, Andhra Pradesh, Kerala and Tamil Nadu on all 3 days; some parts of Punjab and Haryana on day 1

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

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

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

O The northward end of the north-south trough seen yesterday along the interior east peninsular coast of India has moved slightly eastwards and extends from a low level cyclonic circulation over Sub Himalayan West Bengal, southwards to south Tamilnadu across East peninsular India. Moisture is being pumped in the lower levels from the southwest Bay of Bengal. Over south Peninsular India, this low level trough is superposed by an anticyclone aloft which is pushing north-easterly land winds into the region. These winds are producing a dry layer in the middle levels. Hence there is a possibility of thunderstorms over Interior Tamil Nadu and Kerala on day 1. On day 2, ECMWF and IMD GFS deterministic models indicate that the southern position of the trough is likely to move westwards into the Arabian Sea, and convection is likely to decrease.

o At the northern end of the trough, moisture is flowing into the cyclonic circulation over Sub Himalayan West Bengal from the Bay of Bengal and this is aided by the anticyclone over the Bay of Bengal. This is likely to produce thunderstorms over Eastern India on day 1. On day 2, ECMWF and IMD GFS deterministic models indicate that the northwards end of the trough is moving eastwards, and moisture flow into east India will decrease, thereby decreasing the intensity of weather over the region.

**24 hour Advisory for IOP:**

**Rainfall:**

Nil

**Thunderstorm with associated phenomenon:**

**TS with gusty winds:** Kerala, Interior Tamilnadu.

**TS with Squall:** Gangetic West Bengal, Sub Himalayan West Bengal, Odisha, Assam, Meghalaya, Mizoram, Tripura.

**48 hour Advisory for IOP:**

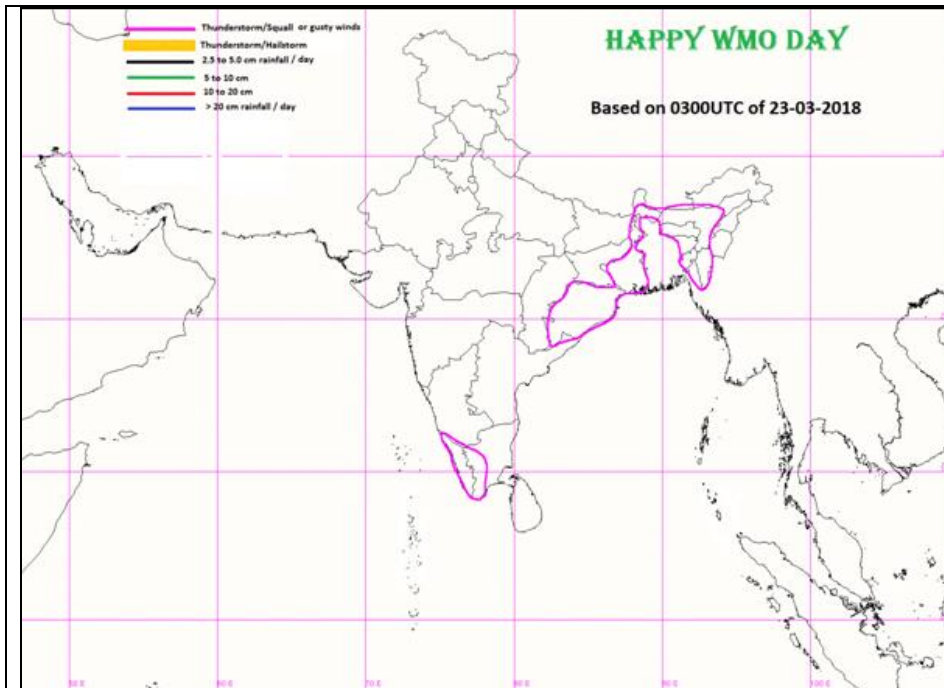
**Rainfall:**

Nil

**Thunderstorm with associated phenomenon:**

Nil

**Graphical Presentation of Potential Areas for Severe Weather:**

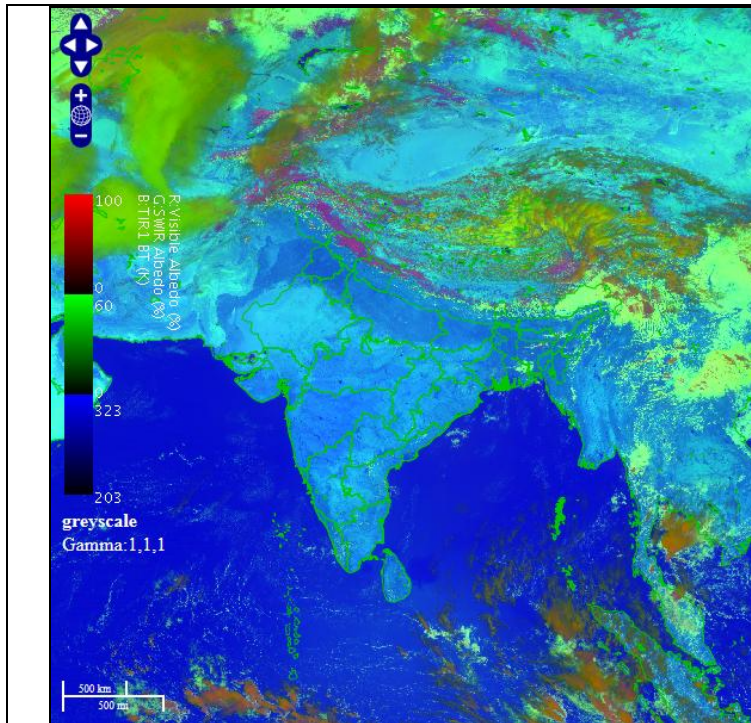


**NO WARNING FOR SEVERE WEATHER**

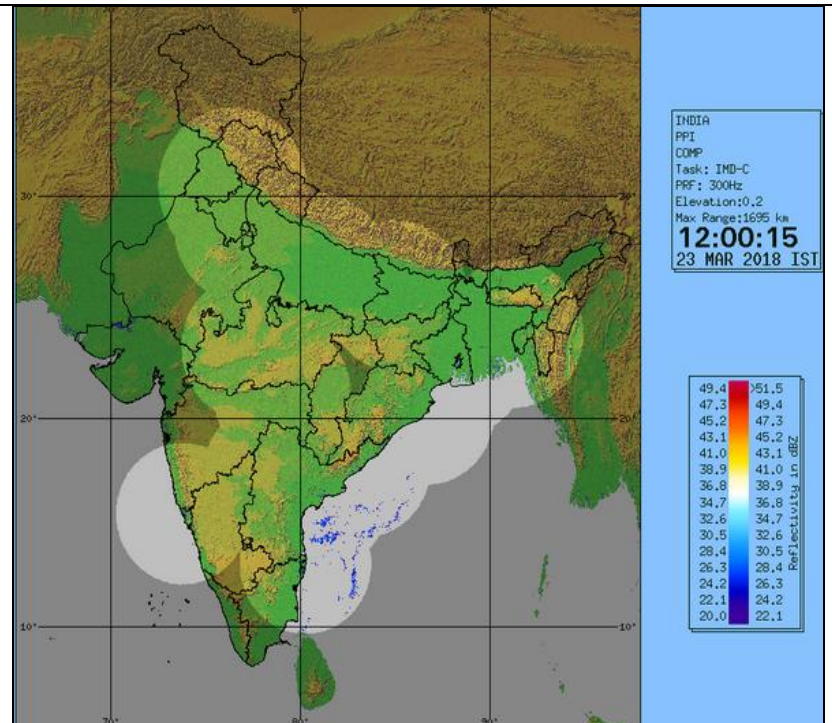
**IOP Advisory for 24 hours**

**IOP Advisory for 48 hours**

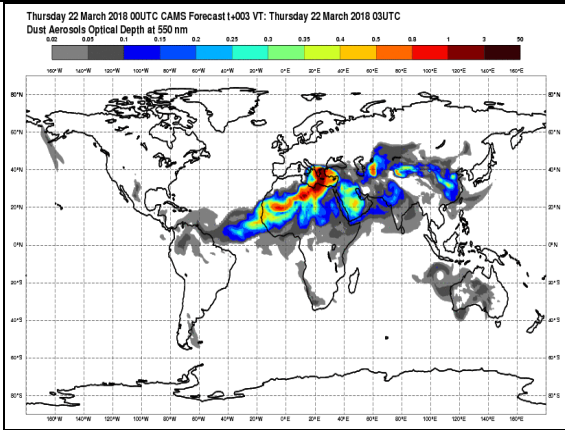




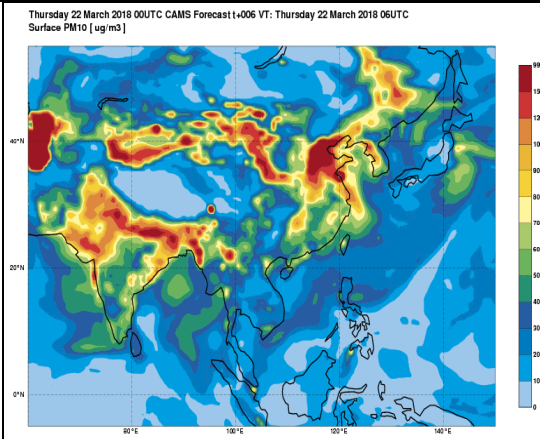
**RAPID RGB Imagery at 1200 IST of the Day**



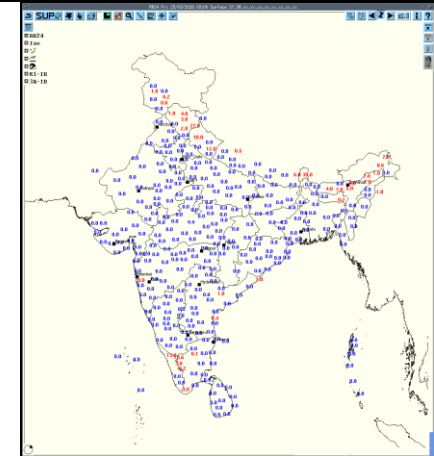
**DWR Composite at 1200 IST of the Day**



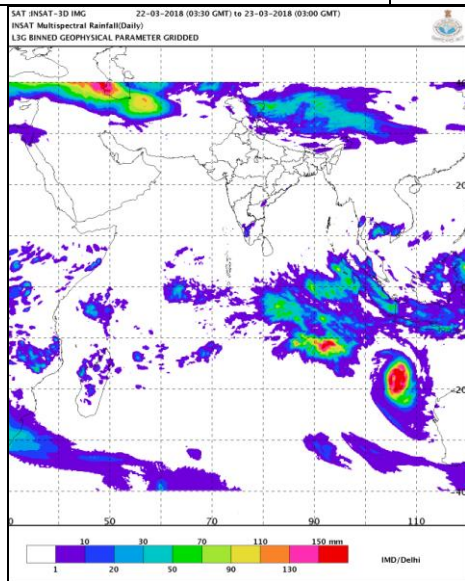
Forecast Dust Concentration



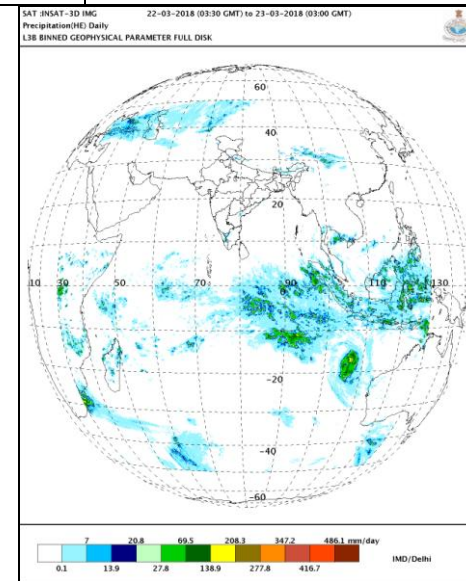
PM10 Forecast



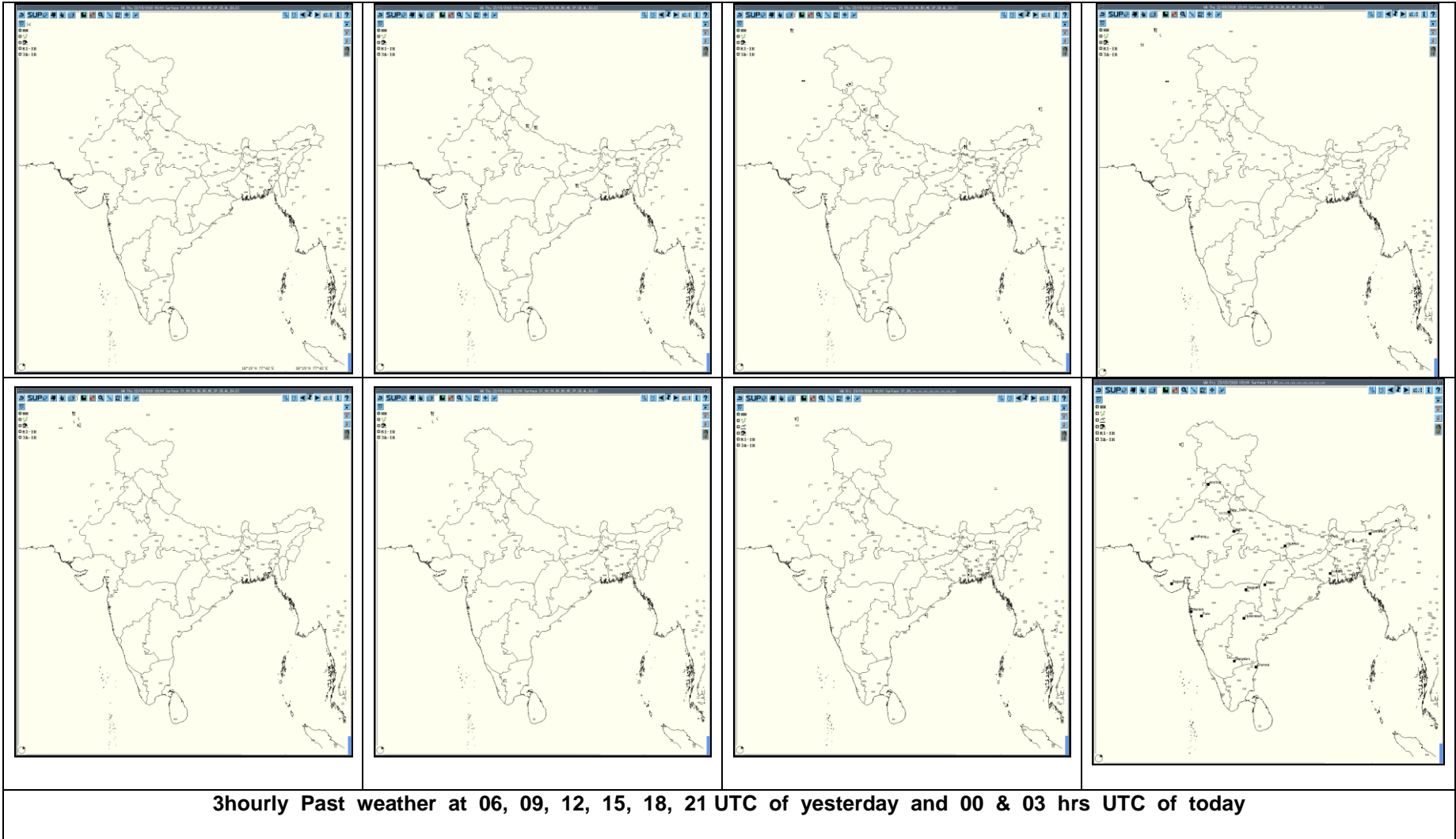
Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today



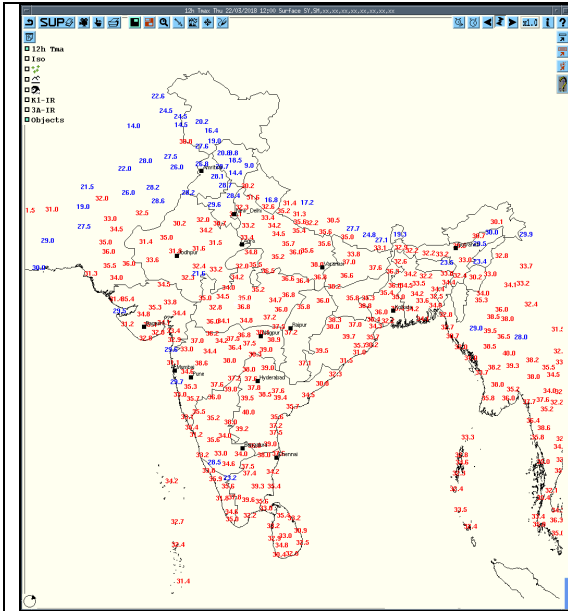
IMR



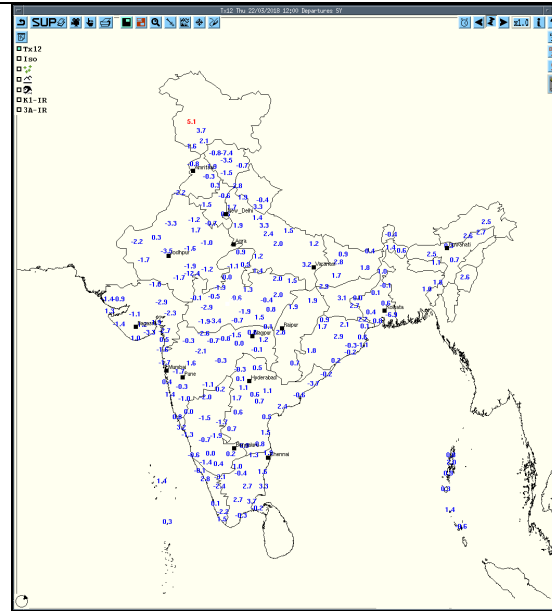
HEM



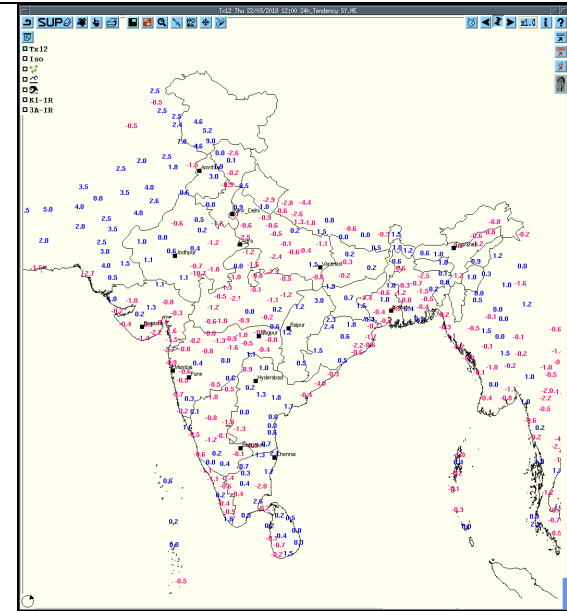
**3hourly Past weather at 06, 09, 12, 15, 18, 21 UTC of yesterday and 00 & 03 hrs UTC of today**



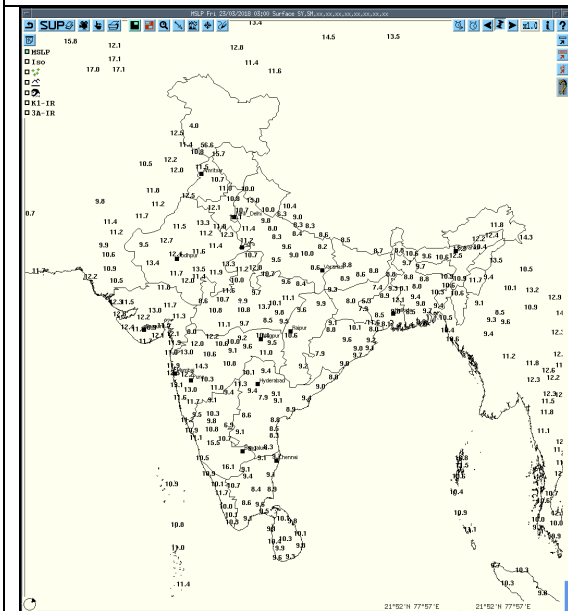
Tmax



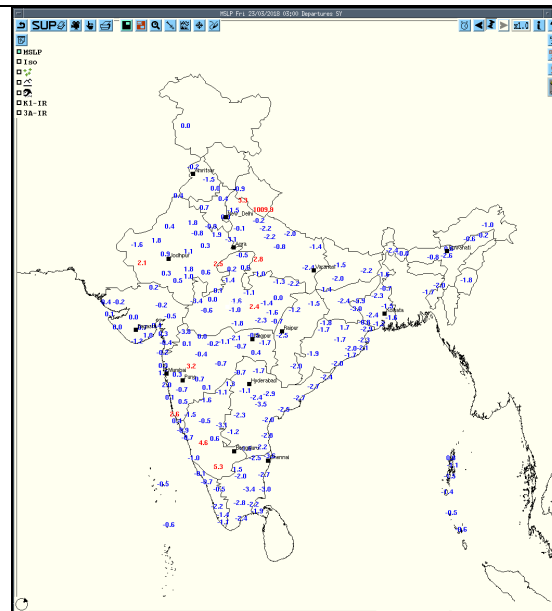
Departure Tmax



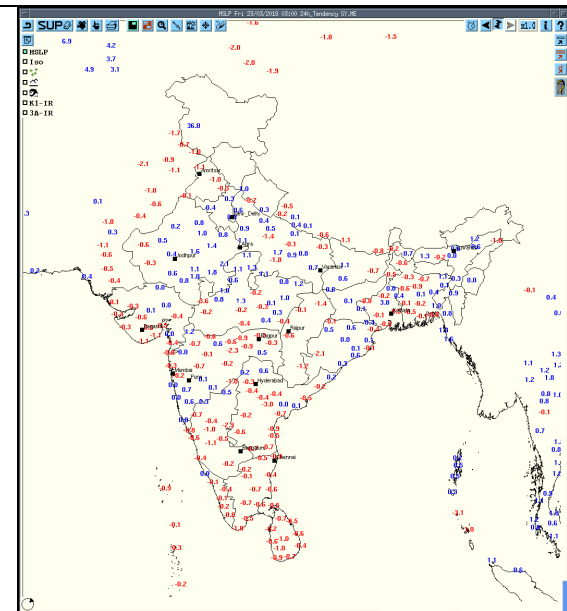
Tendency Tmax



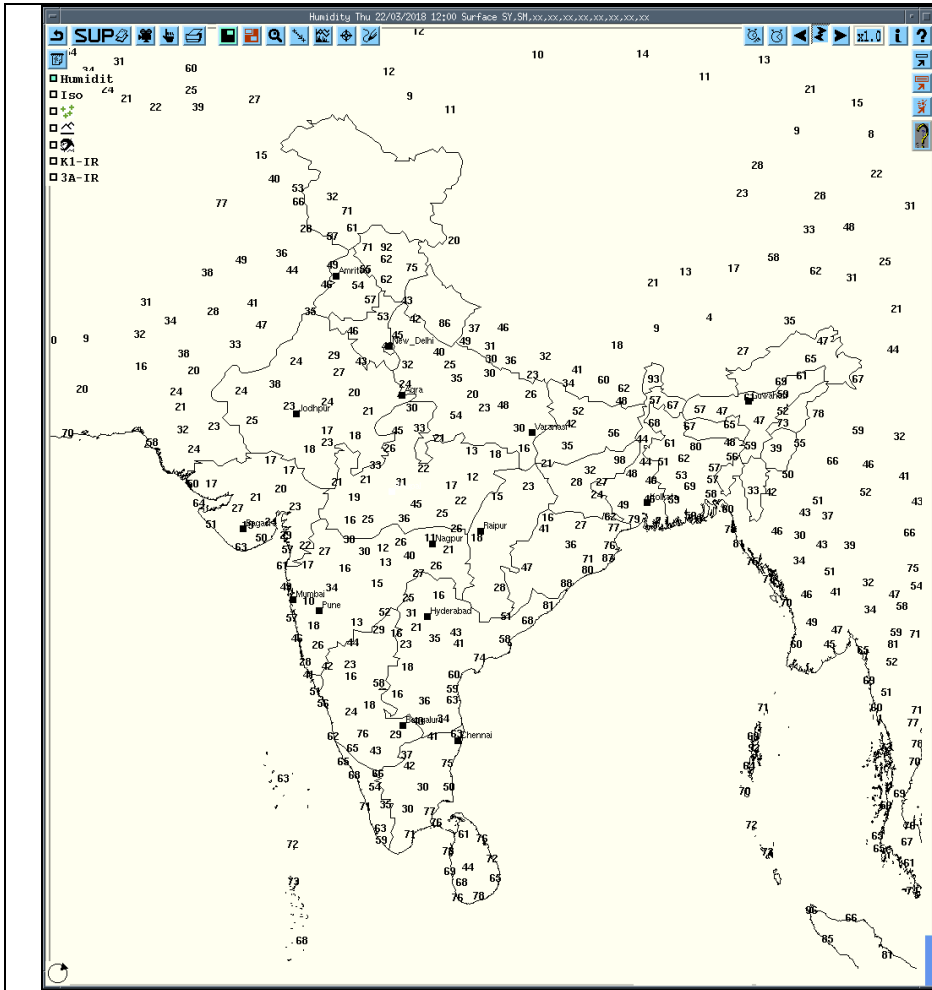
MSLP



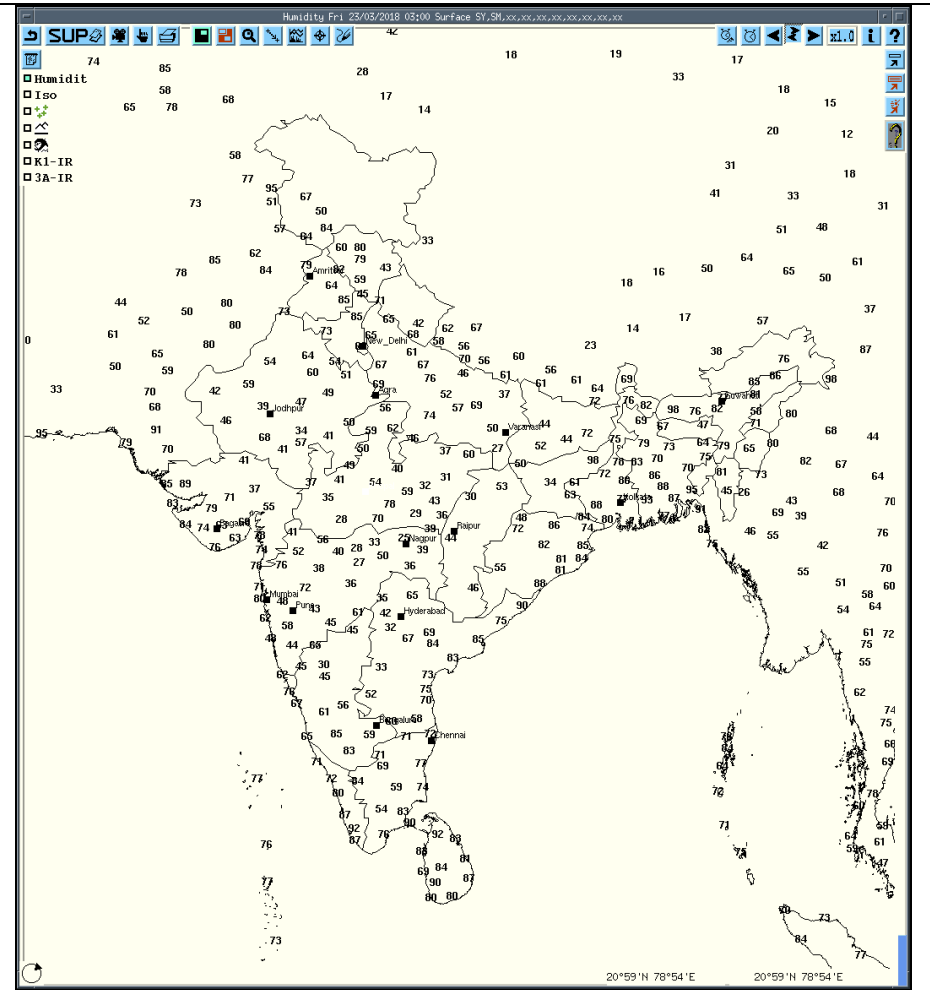
Departure MSLP



Tendency MSLP



RH at 12UTC yesterday



RH at 03UTC today

**Past 24 hours DWR Report:**

DWR Station Name	Date of Report	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
Jaipur	23-03-18	220300-230300	Nil	Nil	Nil	Nil	Nil
Patiala	23-03-18	220300-230252	No Echo	--	--	--	--
Patna	23-03-18	220300-230300	Nil	Nil	Nil	Nil	Nil
Visakhapatnam	23-03-18	220300-220600	Convective region with 57 dBZ Sly with average height 5 kms at a distance of 156 km	Moving Sly	Likely to be dissipated	NIL	NIL
Kolkata	23-03-18	220301-221201	NIL	NIL	NOSIG ECHO	NIL	NIL
		221201-21342	Isolated single cells with maximum height of 9.77 km and maximum reflectivity of 51.0 dBz at 1221 UTC.	NW (151.5 km) moving in E-ly direction at a speed of 5.3m/s	Cell started forming at 1201 UTC in NW at distance of 151.5 km from Radar. Mature and dissipated in West at 1342 UTC at a distance of 109.6 km from radar.	Thunderstorm/Rain	N/A
		221751-221131	One Isolated cells developed at a position 22.707N / 87.108 E/ 277.1 Degree /128.7 km with maximum reflectivity of 54.5 dBz at 1901 UTC and maximum height of 4.93 km at 1901UTC	W (128.7 km) to moving in Easterly direction.	cells formed in WEST at a distance of 128.7 km from Radar at 1751 Matured, dissipated at 2111 UTC at a distance 128.7 km from radar	Thunderstorm / Rain	N/A
		230001-230301	Isolated single cell developed 0142 UTC AT 23.161N / 88.495 E / 12.0 Degree / 67.2 k.m. and maximum reflectivity of 55.5 dBz at 0241 UTC and maximum height 4.93 at 0241 UTC	NORTH (62.5 km) to moving in Easterly direction.	Isolated Single cell formed in North direction at a distance 62.5 k.m. and dissipated at 0401 UTC at a distance 117.5 K.M. from Radar.	Thunderstorm / Rain	N/A

**Realised past 24hrs TS/SQ/HS Data:**

Realised TS/HS/SQ during past 24 hours ending at 0300UTC of today(received from RMCs/MCs)						
Name of Station Reporting	Region	State/Sub Division	Weather Event (TS/Hail/Squall)	Date	Time of Commencement (IST)	Time of end (IST)
Mukteshwar	Northwest India	Uttarakhand	Thunderstorm	22-03-18	1315 1605	1425 1615
Tehri	Northwest India	Uttarakhand	Thunderstorm	22-03-18	0850	1340
			Thunderstorm with hail	22-03-18	2110	---
Srinagar					1510	1512
Katra					1605	1630
Itanagar	Northeast India	Arunachal Pradesh	Thunderstorm	23-3-18	0550	0610
Jorhat	Northeast India	Assam	Thunderstorm	22/23-03-18	222015	230415
N/Lakhimpur	Northeast India	Assam	Thunderstorm	22-03-18	2100	2320
					2330	2345
Tezpur	Northeast India	Assam	Thunderstorm	22/23-03-18	22/1930	23/0400
Guwahati	Northeast India	Assam	Thunderstorm	22/23-03-18	22/2325	23/0620
Gangtok	East India	Sikkim	Thunderstorm	22-03-18	1250 1550	1300 2100
			<b>Thunderstorm with hail (diameter 1.0cm)</b>	<b>22-03-18</b>	<b>1615 1650</b>	<b>1620 1700</b>
Tadong	East India	Sikkim	Thunderstorm	22-03-18	1530	1820
			<b>Thunderstorm with hail (diameter 1.0cm)</b>	<b>22-03-18</b>	<b>1700</b>	<b>1710</b>

## IMPORTANT LINKS:

For NCMRWF NWP products:(<http://www.ncmrwf.gov.in/HomePage/NEPS-prod-1.php>)

For IMD NWP products:([http://nwp.imd.gov.in/diagpro\\_new.php](http://nwp.imd.gov.in/diagpro_new.php))

For Synoptic plotted data and charts

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

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

For RANDHRA PRADESHID tool:

[http://rAndhra\\_Pradeshid.imd.gov.in/](http://rAndhra_Pradeshid.imd.gov.in/)

Low Level Winds

[http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/LLW/MAR\\_2017/?C=M;O=D](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/mAndhra\\_Pradesh\\_skm2.html](http://satellite.imd.gov.in/mAndhra_Pradesh_skm2.html)

## WEATHER SYMBOLS:

