



# India Meteorological Department

## FDP STORM Bulletin No. 21 (27-03-2018)

### 1. CURRENT SYNOPTIC SITUATION:

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

- The Western Disturbance as a trough in mid-tropospheric westerlies roughly along 73°E to the north of Lat.32°N now seen as a cyclonic circulation at 3.1 km above mean sea level over eastern parts of Jammu & Kashmir and neighbourhood.
- A fresh Western Disturbance as a trough in mid & upper tropospheric westerlies runs with its axis at 7.6 km above mean sea level roughly along 62°E to the north of Lat.30°N.
- The core of sub-tropical westerly Jet stream is now seen mainly over eastern India between Lat. 23°N and 26°N at 9.5 km above mean sea level over the Indian region.
- A east-west trough runs from east Bihar to Manipur across south Assam and extends upto 1.5 km above mean sea level.
- The cyclonic circulation extending upto 0.9 km above mean sea level over Coastal Karnataka and neighbourhood now lies over North Interior Karnataka and adjoining south Madhya Maharashtra.
- The cyclonic circulation over Comorin area and neighbourhood extending upto 0.9 km above mean sea level now lies over Comorin-Maldives area and extends upto 1.5 km above mean sea level.

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

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

##### Western Disturbance (WD):

Scattered low/medium clouds seen over North Afghanistan adjoining North Pakistan, North Jammu & Kashmir and over the area between lat 37.0°N to 46.0°N, long 65.0°E to 86.0°E in association with WD over the area.

##### Westerly Trough and Jet Stream:

Trough in westerly is seen roughly along long 73.0°E and north of lat 32.0°N.

Westerly Jet Stream runs over Indian Region between Lat 21.0°N to 27.0°N.

##### Clouds description within India:

Scattered low/medium clouds with embedded isolated weak to moderate convection over Arunachal Pradesh, Assam, Meghalaya, Nagaland and Manipur. Scattered low/medium clouds with embedded isolated weak convection seen over Rayalaseema, South Coastal Andhra Pradesh, South Interior Karnataka, Kerala and Tamilnadu. Scattered low/medium clouds seen over rest Jammu & Kashmir, North Himachal Pradesh, Coastal

Odisha, East Gangetic West Bengal, Sub-Himalayan West Bengal, Sikkim, rest north-eastern states, Konkan, North Interior Karnataka, Telangana, North Coastal Andhra Pradesh, and Nicobar Islands. Scattered medium/high clouds seen over central Uttar Pradesh and West Gujarat.

**Arabian Sea:**

Scattered low/medium clouds with embedded isolated weak to moderate convection seen over Comorin and west central Arabian Sea.

**Bay of Bengal & Andaman Sea:**

Scattered low/medium clouds with embedded isolated weak convection seen over Southeast Bay south of Lat 9.0°N and South Andaman Sea.

**Past Weather:**

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

Moderate to intense convection was observed over North-West J&K South Assam Tripura Manipur Mizoram South Tamilnadu and weak to moderate convection observed over Sikkim rest North-East States Andhra Pradesh South Interior Karnataka Kerala rest Tamilnadu.

**OLR:-**

Upto 230  $\text{wm}^{-2}$  was observed over J&K North Himachal Pradesh North Uttarakhand Sikkim Arunachal Pradesh South Assam Manipur Kerala and Tamilnadu.

**Convective Activity:**

CELL NO.	DATE/ TIME (UTC)	AREA/ LOCATION	MINIMUM CTBT (MINUS DEG C)	MOVEMENT/ REMARKS
1	26/1100	NE BD ADJ N TRP	70	DEVELOPING
	1200	NE BD ADJ N TRP ADJ S ASSAM	67	E-WARDS
	1300	N TRP ADJ S ASSAM ADJ N MIZO	70	
	1400	S ASSAM ADJ N MIZO	50	
	1500	DO	----	DISSIPATED

**Synoptic features:**

Trough in Westerlies roughly along Longitude 73.0°E & north of Latitude 32.0°N.

Westerly Jet Stream over Indian region between Latitude 21.0°N to 27.0°N.

**Dynamic Features:**

Negative shear tendency is observed over Gujarat adjoining Rajasthan Uttar Pradesh Bihar Sikkim Arunachal Pradesh and positive shear tendency observed over rest 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 Uttarakhand North Uttar Pradesh Gangetic West Bengal.

Positive Low Level Convergence over India region.

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

Rainfall upto 01-10 mm observed over north J&K Sikkim North-East States Tamilnadu.

**HEM:**

Rainfall upto 7-14 mm observed over Arunachal Pradesh Manipur and

Rainfall upto 7 mm observed over rest North-East States South Kerala Tamilnadu.

**RADAR and RAPID RGB Observation:**

Isolated/Multiple moderate echoes (dBZ 45-50 and height 8-9km) were seen on DWR Cherrapunjee domain at around 1230 IST.

RAPID RGB Satellite imagery at 1130IST indicates moderate convection over North Jammu & Kashmir, Arunachal Pradesh, Assam, Meghalaya, and Mizoram.

**2. NWP MODEL GUIDANCE:****NCMRWF (NCUM forecast based on 00UTC the day):****1. Weather Systems:****Low level CYCIRS, Troughs:**

**12 UTC of Day 0-4:** 925 hPa feeble trough over central Maharashtra, at 850 hPa over WB and Bangladesh from Day-0 to Day-3

**Confluence & Wind Discontinuity Regions:**

**12 UTC of Day 1-3:** at 850 hPa S-N wind discontinuity over interior peninsula extending SW-NE along the east coast

**Synoptic Systems:**

**12 UTC of Day 1-3:** 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.

**12UTC Day-2 and 00UTC Day-3:** over Punjab-J&K; **12UTC of Day-3** over UP.

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

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

Day0: NE\_NMMT, Odisha, Madhya\_Maharashtra, Coastal\_AP, TN\_Puducherry, NI\_Karnataka, SI\_Karnataka, Kerala,  
Day1: Jharkhand, Odisha, East\_MP, Madhya\_Maharashtra, Coastal\_AP, Telangana, TN\_Puducherry, NI\_Karnataka, SI\_Karnataka, Kerala,  
Day2: Assam\_Meghalaya, Gangetic\_WB, Jharkhand, Uttarakhand, Jammu\_Kashmir, Odisha, Coastal\_AP, NI\_Karnataka, SI\_Karnataka,  
Day3: Arunachal\_Pradesh, NE\_NMMT, Gangetic\_WB, Jharkhand, East\_UP, Odisha, Madhya\_Maharashtra, Vidarbha, Chhattisgarh, Telangana, Rayalaseema, NI\_Karnataka, SI\_Karnataka,  
Day4: NE\_NMMT, Gangetic\_WB, Jharkhand, Bihar, Odisha, East\_MP, Madhya\_Maharashtra, Vidarbha, Telangana, Rayalaseema, NI\_Karnataka, SI\_Karnataka.

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

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

Day0: Uttarakhand, Himachal\_Pradesh, Saurashtra\_Kutch, Madhya\_Maharashtra, Coastal\_AP,  
Day1: NE\_NMMT, Jharkhand, West\_UP, Uttarakhand, Himachal\_Pradesh, Odisha, Coastal\_AP,  
Day2: Assam\_Meghalaya, Sub\_Himalayan\_WB, Jharkhand, Bihar, Uttarakhand, Punjab, Himachal\_Pradesh, Jammu\_Kashmir, Odisha, Coastal\_AP, TN\_Puducherry,  
Day3: Arunachal\_Pradesh, Assam\_Meghalaya, Jharkhand, Bihar, East\_UP, West\_UP, Himachal\_Pradesh, Jammu\_Kashmir, Odisha,  
Day4: Assam\_Meghalaya, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, Uttarakhand, Chhattisgarh.

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

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

Day0: Arunachal\_Pradesh, NE\_NMMT, Sub\_Himalayan\_WB, Uttarakhand, Himachal\_Pradesh, Jammu\_Kashmir, Konkan\_Goa, Madhya\_Maharashtra, TN\_Puducherry, Coastal\_Karnataka, NI\_Karnataka, SI\_Karnataka,  
Day1: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Uttarakhand, Madhya\_Maharashtra, Coastal\_Karnataka, NI\_Karnataka, SI\_Karnataka, Kerala,  
Day2: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Bihar, Uttarakhand, Himachal\_Pradesh, Odisha, TN\_Puducherry, Coastal\_Karnataka, SI\_Karnataka, Kerala,  
Day3: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, Odisha, Coastal\_AP, TN\_Puducherry, SI\_Karnataka, Kerala,

Day4: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, Uttarakhand, Odisha, Coastal\_AP, TN\_Puducherry, Kerala.

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

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

Day0: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Uttarakhand, Himachal\_Pradesh, Jammu\_Kashmir, Konkan\_Goa, Madhya\_Maharashtra, Coastal\_Karnataka, NI\_Karnataka,

Day1: Arunachal\_Pradesh, NE\_NMMT, Sub\_Himalayan\_WB, Bihar, Uttarakhand, Punjab, Himachal\_Pradesh, Jammu\_Kashmir,

Day2: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, Uttarakhand, Hry\_Chhd\_Delhi, Punjab, Himachal\_Pradesh, Jammu\_Kashmir, Odisha,

Day3: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, West\_UP, Uttarakhand, Jammu\_Kashmir, Odisha, Coastal\_AP,

Day4: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, West\_UP, Uttarakhand, Odisha, East\_MP, Madhya\_Maharashtra, Vidarbha, Chhattisgarh, Coastal\_AP, Telangana

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

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

Day0: Arunachal\_Pradesh, Sub\_Himalayan\_WB, Konkan\_Goa, Madhya\_Maharashtra, TN\_Puducherry, Coastal\_Karnataka, NI\_Karnataka, SI\_Karnataka, Kerala,

Day1: Arunachal\_Pradesh, Sub\_Himalayan\_WB, Rayalaseema, TN\_Puducherry, SI\_Karnataka, Kerala,

Day2: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Coastal\_AP, Rayalaseema, TN\_Puducherry, SI\_Karnataka, Kerala,

Day3: Coastal\_AP, Telangana, Rayalaseema, TN\_Puducherry, SI\_Karnataka, Kerala,

Day4: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP, Odisha, Rayalaseema, TN\_Puducherry, SI\_Karnataka, Kerala.

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

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

Day1: Arunachal\_Pradesh, Assam\_Meghalaya, NE\_NMMT,

Day2: Sub\_Himalayan\_WB,

Day3: Arunachal\_Pradesh, Assam\_Meghalaya,

Day4: Arunachal\_Pradesh, Assam\_Meghalaya, Sub\_Himalayan\_WB, Bihar, East\_UP, Uttarakhand,

Day5: Assam\_Meghalaya, Sub\_Himalayan\_WB, Gangetic\_WB, Jharkhand, Bihar, East\_UP.

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

#### Summary and Conclusions:

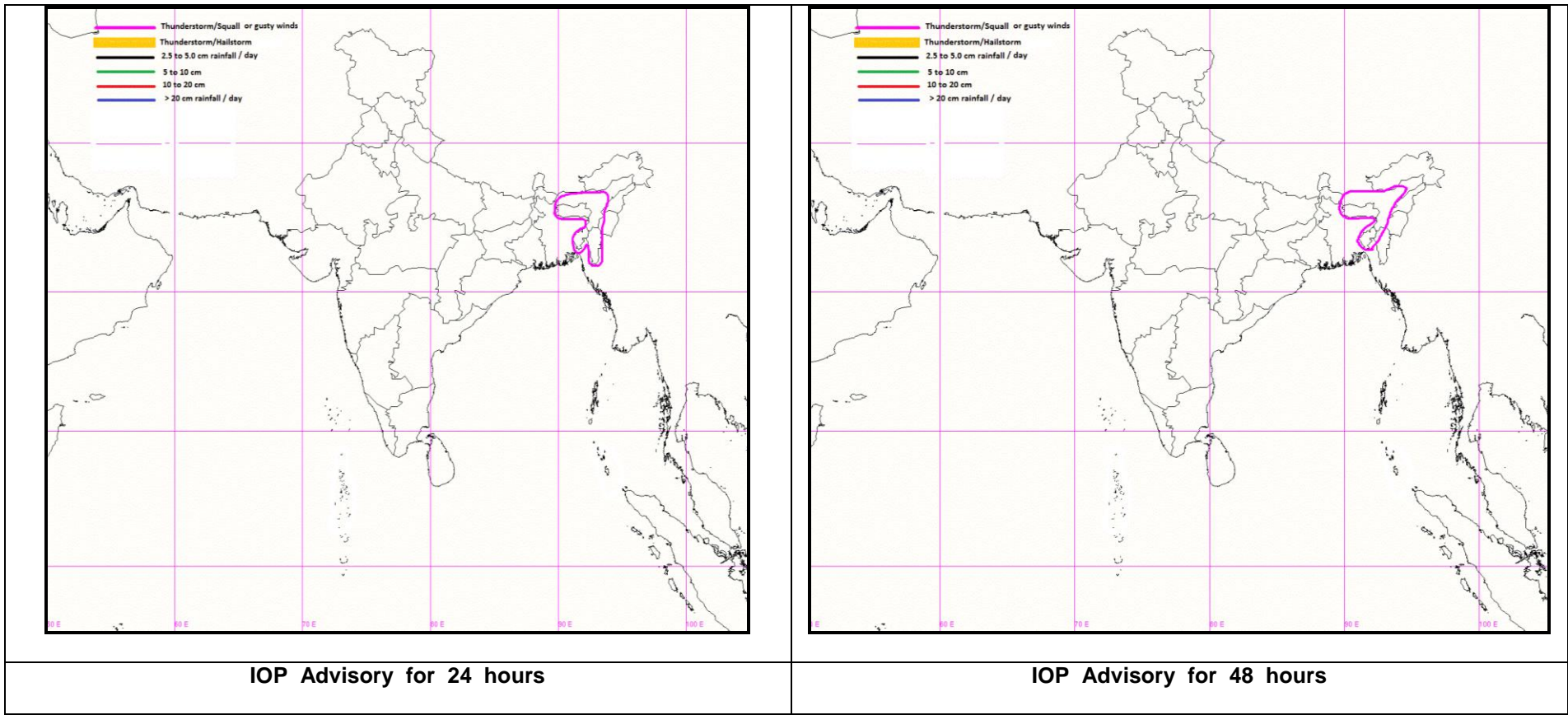
##### Day-1 & Day-2:

o Synoptic analysis indicates that an eastwest trough runs from east Bihar to Manipur across south Assam and extends upto 1.5 km above mean sea level. This trough is not seen in the analysis fields of ECMWF and IMD GFS deterministic models. Associated with this trough, there will be moisture flow into Mizoram, Tripura and south Assam. However, there is not much support from the jet in the upper atmosphere. Consequently, thunderstorms with gusty winds are expected over North-east India on day 1. The trough is not likely to decay on day 2 and the same weather pattern is likely to continue on day 2.

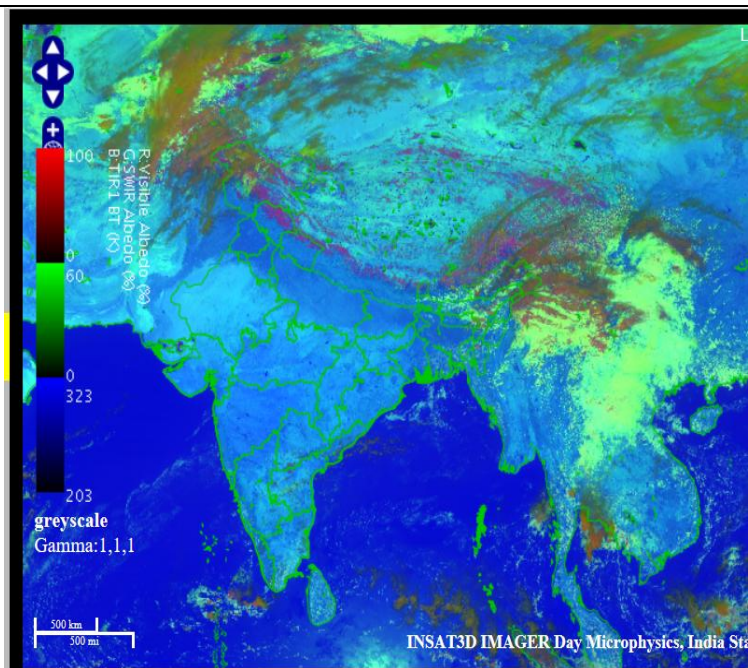
o Over South India, synoptic analysis indicates that there are two cyclonic circulations in the low levels (1) over North Interior Karnataka and adjoining south Madhya Maharashtra in the lower levels and (2) over Comorin Maldives area. IMD GFS deterministic model indicate a north-south oriented trough over south-west peninsula while ECMWF indicates only a wind discontinuity in the lower levels. This is overlaid by anticyclonic wind flow over the region. Hence there is likelihood of isolated rainfall over south-west peninsular India on day 1 and less so on day 2

<b>24 hour Advisory for IOP:</b> <b>Rainfall:</b> Nil <b>Thunderstorm with associated phenomenon:</b> Assam and Meghalaya, Mizoram and Tripura.	<b>48 hour Advisory for IOP:</b> <b>Rainfall:</b> Nil <b>Thunderstorm with associated phenomenon:</b> Assam and Meghalaya, Tripura.
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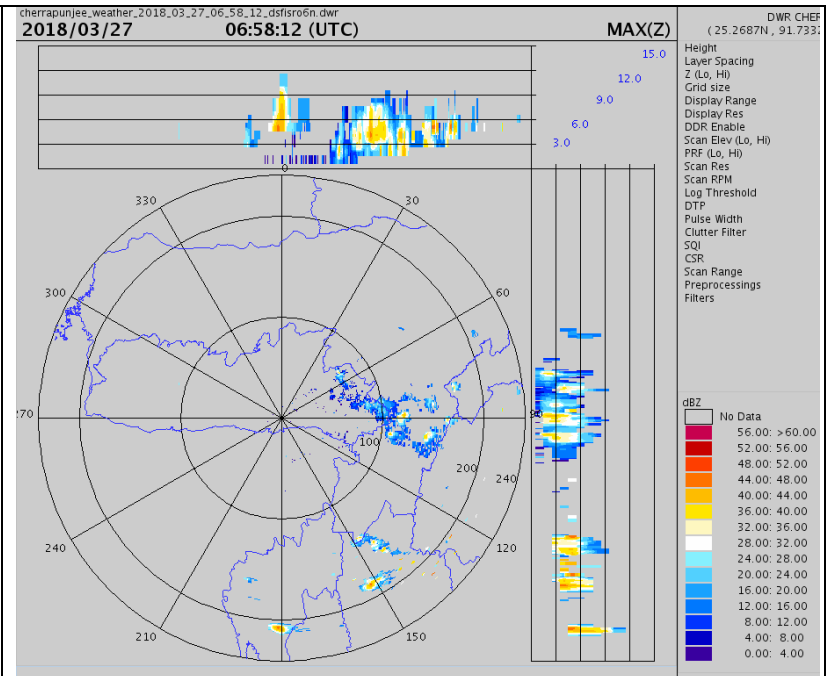
Graphical Presentation of Potential Areas for Severe Weather:







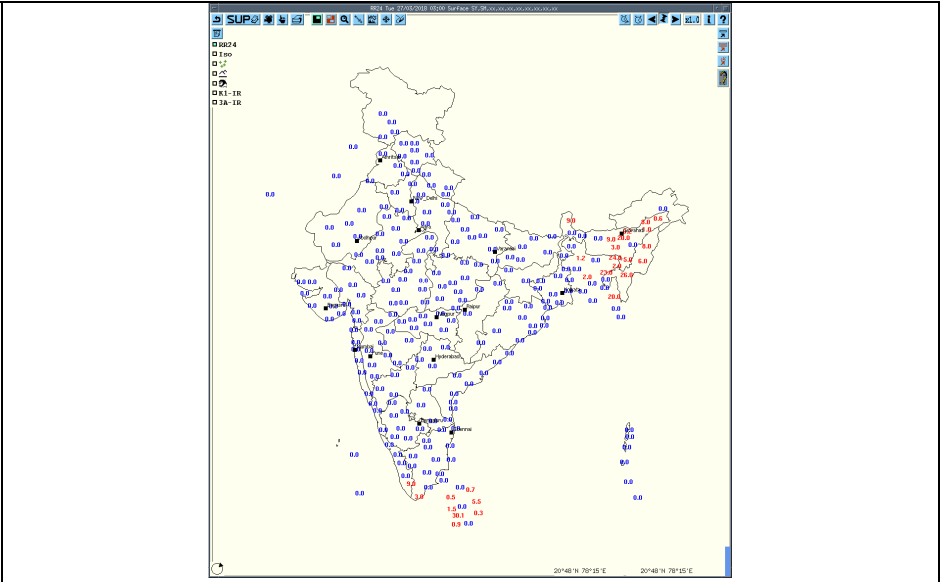
**RAPID RGB Imagery at 1130 IST of the Day**



**DWR Cherrapunjee at 1228 IST of the Day**

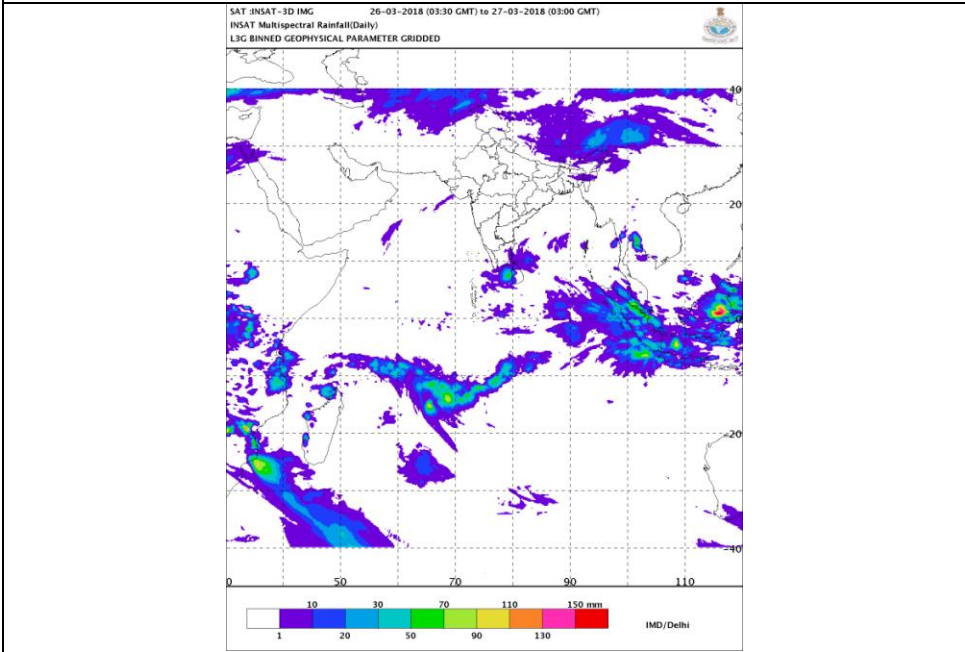


**Not Received**

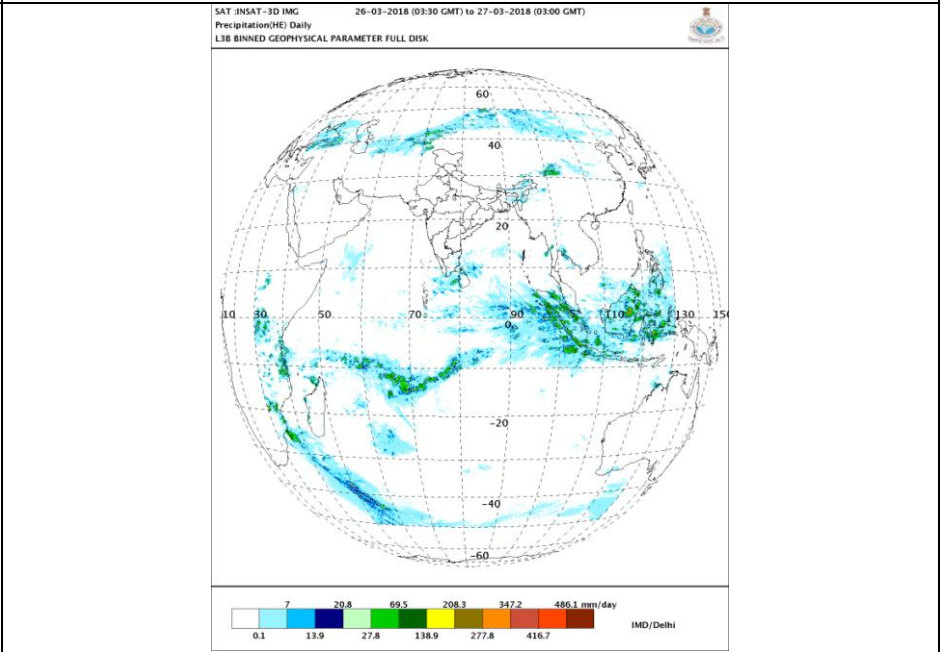


Environmental condition (dust etc) and its forecast
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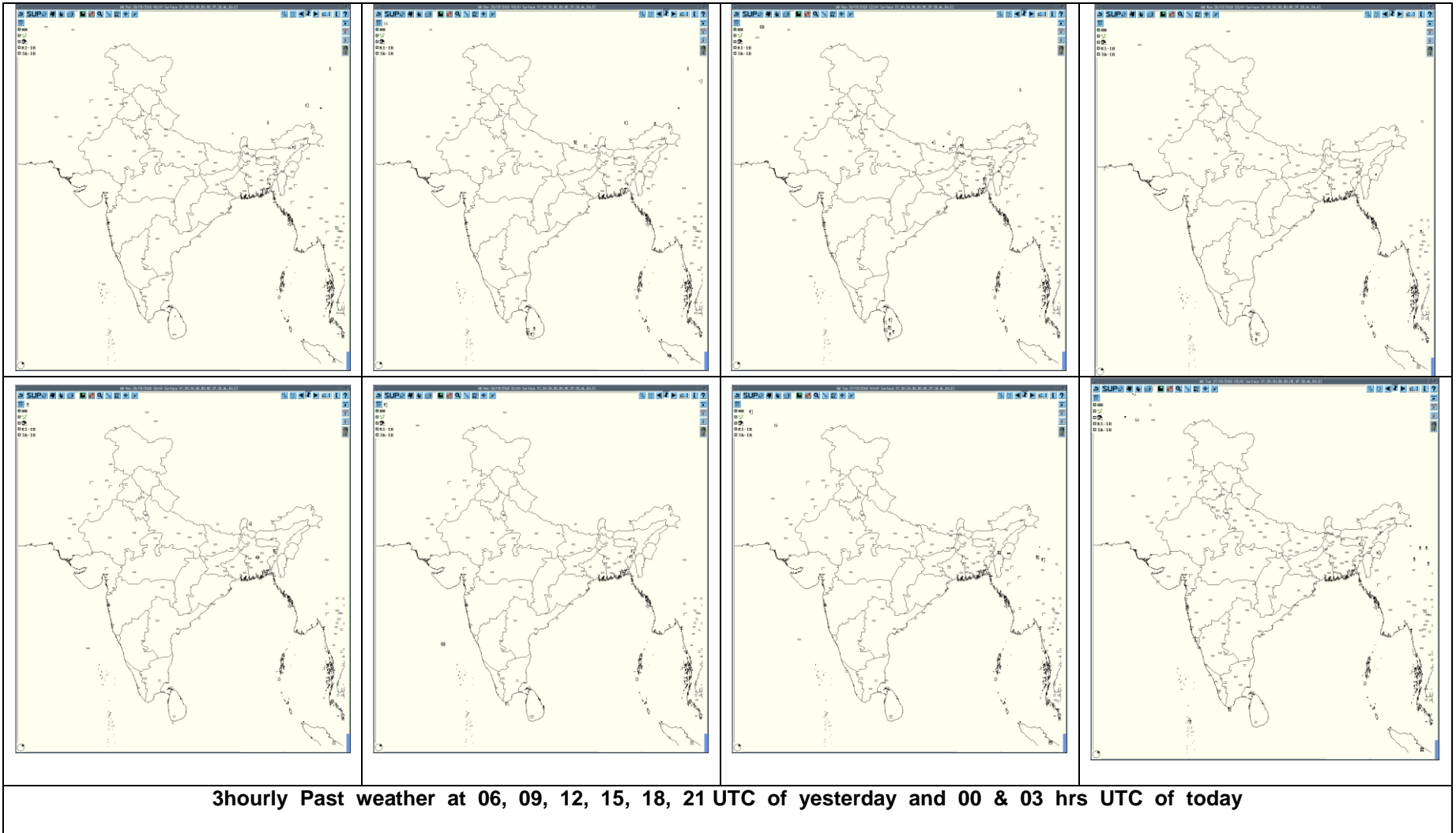
<p><b>Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today</b></p>
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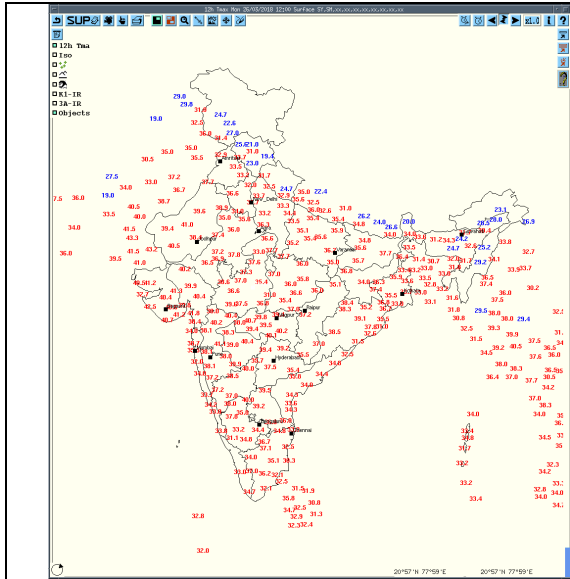
IMR
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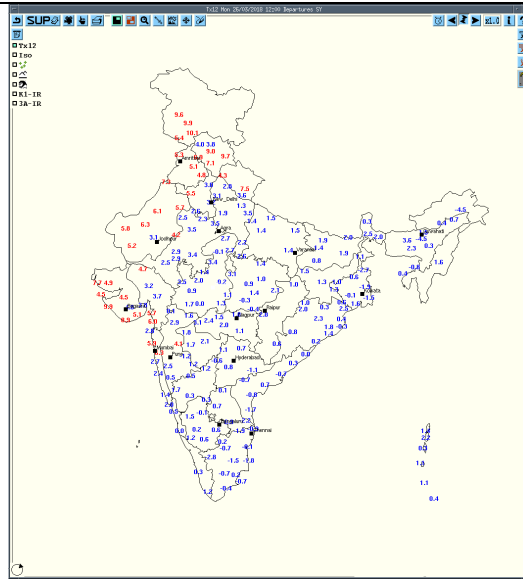
HEM
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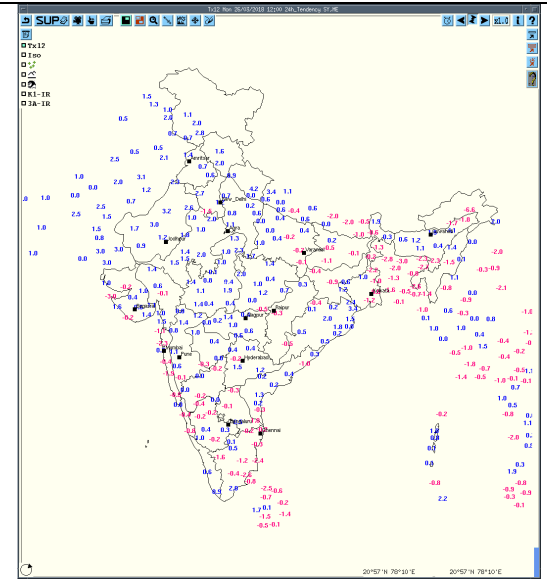
3hourly Past weather at 06, 09, 12, 15, 18, 21 UTC of yesterday and 00 & 03 hrs UTC of today



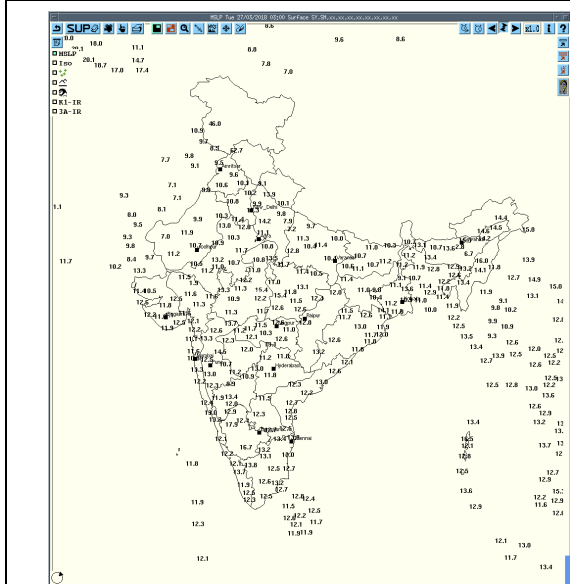
Tmax



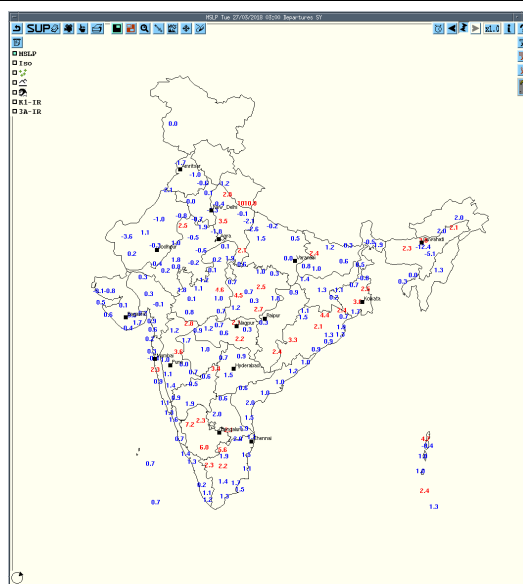
Departure Tmax



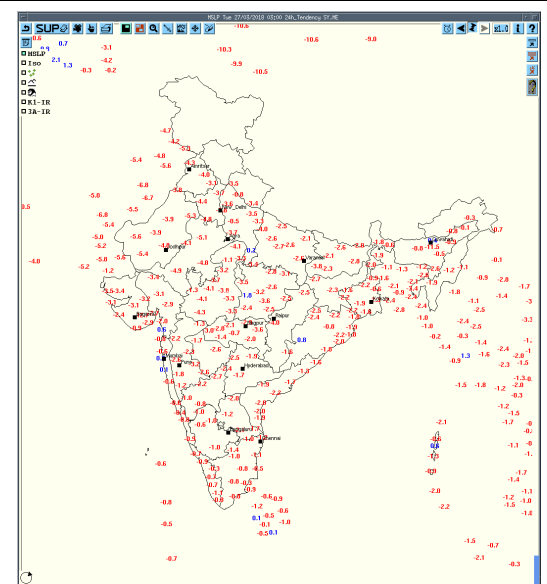
Tendency Tmax



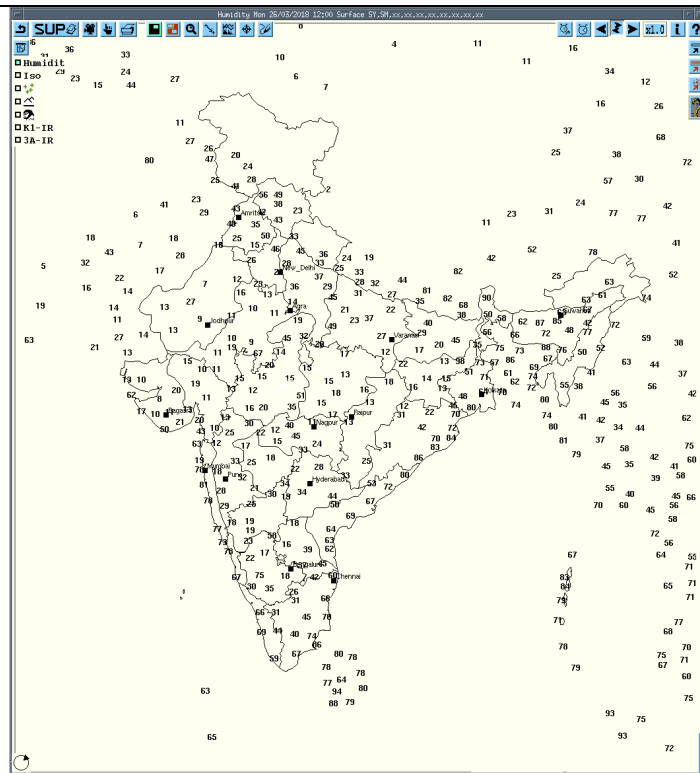
MSLP



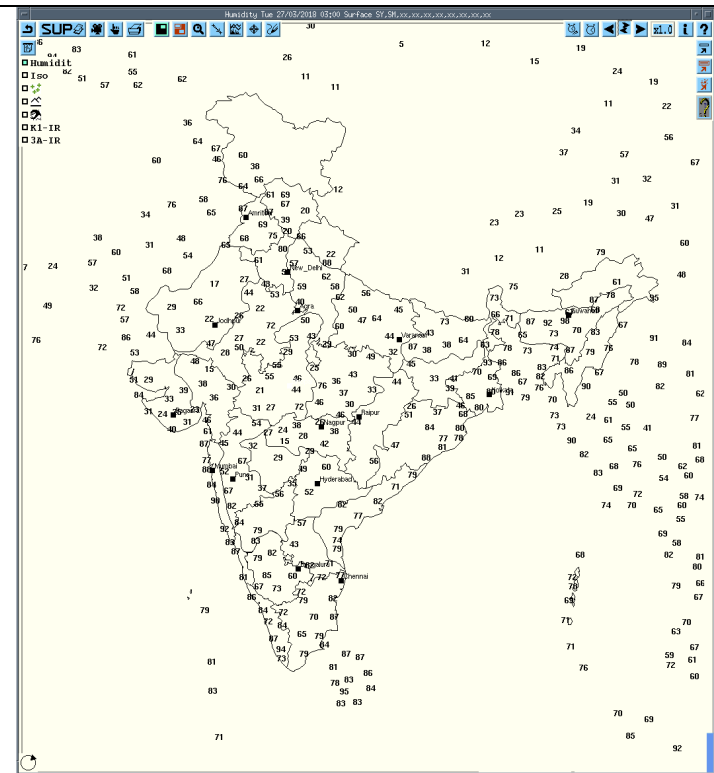
Departure MSLP



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
Kolkata	27-03-18	260301-270300	Nil	Nil	Nil	Nil	Nil
Patiala	27-03-18	260300-270252	No Echo	Nil	Nil	Nil	Nil
Lucknow	27-03-18	260300-270300	Nil	Nil	Nil	Nil	Nil
Jaipur	27-03-18	260300-270300	Nil	Nil	Nil	Nil	Nil
Patna	27-03-18	260300-270300	Nil	Nil	Nil	Nil	Nil
Visakhapatnam	27-03-18	260900	Line of Cb cells of max reflectivity 44 DBZ NE ly over the coast at a distance of 73kms with height 3kms.	NIL	Being dissipated	NIL	NIL
		261200	Cb cell westerly with reflectivity 50 dbz and height 10kms at a distance of 128kms	Formed since 10:21 UTC and moving westerly.	Being dissipated	NIL	NIL
		261500	Conviction region NEly over the coast with max reflectivity 41 dbz and height 3kms at a distance of 109kms.	Formed since last observation (1200 UTC)	Being dissipated	NIL	NIL
		270000	Region of cb cells SSE ly at a distance of 113kms with max reflectivity 49dbz and height 3kms	Formed at 2001UTC and developed , moving SE ly	Likely to be intensified	NIL	NIL

## 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 Commence ment (IST)	Time of end (IST)
Jorhat	Northeast India	Assam	Thunderstorm	26-03-18	1940	2030
Silchar	Northeast India	Assam	Thunderstorm	26-03-18	262100	270600
Dibrugarh	Northeast India	Assam	Thunderstorm	26-03-18	262100	270400
N/Lakhimpur	Northeast India	Assam	Thunderstorm	26/27-03-18	1010 2120 0045	1115 2240 0400
Tezpur	Northeast India	Assam	Thunderstorm	26/27-03-18	262230	270200
Guwahati	Northeast India	Assam	Thunderstorm	26/27-03-18	0940 0120	1020 0250
			<b>Squall From West With Max. Wind Speed 29kt</b>	<b>26-03-18</b>	<b>1524</b>	<b>1525</b>
Shillong	Northeast India	Meghalaya	Thunderstorm	26-03-18	1450	1500
			<b>Hailstorm (diameter:0.25cm)</b>	<b>27-03-18</b>	<b>0400</b>	<b>0500</b>
Lengpui	Northeast India	Mizoram	Thunderstorm	26/27-03-18	1855 0400	2100 0500
Kailasahar	Northeast India	Tripura	Thunderstorm	26/27-03-18	1810 0015	1900 0240
Agartala	Northeast India	Tripura	Thunderstorm	26-03-18	1650 1830	1750 1920
			<b>Squall From North With Max. Wind Speed 46Kt</b>	<b>26-03-18</b>	<b>1746</b>	<b>1748</b>
Gangtok	East India	Sikkim	Thunderstorm	26-03-18	1440	1745
Tadong	East India	Sikkim	Lightening	26-03-18	1520	1720
Tadong	East India	Sikkim	Thunderstorm	26-03-18	1430	1900



## 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(upto03UTCof today)

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)

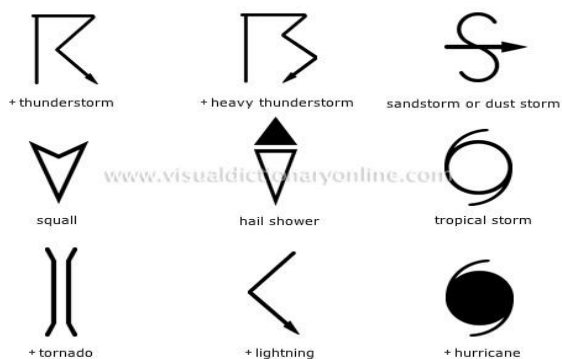
For Radar images of the past 24 hours including mosaic of images:

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

Satellite sounder based T- Phigram

[http://satellite.imd.gov.in/mAndhra\\_Pradesh\\_skm2.html](http://satellite.imd.gov.in/mAndhra_Pradesh_skm2.html)

## WEATHER SYMBOLS:



∞	haze
☼	smoke
☼	dust or sand storm
☼	fog
☼	drizzle
•	rain
*	snow
▽	showers
△	hail
☼	thunderstorm
<b>Weather Symbols</b>	