



India Meteorological Department
FDP STORM Bulletin No. 11(16-03-2017)

1. CURRENT SYNOPTIC SITUATION at 0300 UTC of 16-03-2017:

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.

A trough runs from northeast Rajasthan to Gujarat region and extends upto 0.9 km above mean sea level.

The upper air cyclonic circulation over North Interior Karnataka & neighbourhood now lies over North Interior Karnataka and adjoining south Madhya Maharashtra & Marathwada and extends upto 0.9 Km above mean sea level.

The trough in lower level easterlies from Maldives area to Coastal Karnataka now seen as wind discontinuity from Lakshadweep area to West Vidarbha across Interior Karnataka and Marathawada at 1.5 km above mean sea level.

A trough runs from Sub Himalayan West Bengal to south Odisha across Gangetic West Bengal and extends upto 0.9 km above mean sea level.

A fresh Western Disturbance very likely to affect northwest India from 19th March onwards.

The induced upper air cyclonic circulation over central Pakistan and adjoining West Rajasthan has become less marked.

SATELLITE OBSERVATIONS during past 24hrs and current observation (Based on 0900 UTC Imagery of INSAT-3D):

Clouds (based on 0900 UTC imagery):

Scattered multi-layered clouds seen over J & K, Himachal Pradesh, Uttrakhand, Punjab, Haryana and North Rajasthan in association with western disturbance over the area. Scattered low/medium clouds seen over Delhi, NW Uttar Pradesh, South Madhya Pradesh and adjoining Maharashtra. Scattered low/medium clouds with embedded moderate to intense convection seen over Tamilnadu and Lakshadweep. Scattered low/medium clouds with embedded isolated weak to moderate convection over Kerala, South Interior Karnataka.

Arabian Sea:-

Scattered low/medium clouds with embedded moderate to intense convection seen over southeast Arabian Sea and adjoining Indian Ocean.

Bay of Bengal & Andaman Sea:-

Scattered low/medium clouds with embedded isolated weak to mod convection seen over Southwest Bays and south Andaman Sea

Convection:

Weak convection (CTT above 250° K in some places) was observed over north Rajasthan ,UP , Bihar , coastal Odisha and coastal Gangetic west Bengal .

Moderate convection was observed over northern states of J&K HP, Punjab and Uttrakhand with CTT > 240° K.

Strong convection with CTT reaching upto 220° K was observed over Tamil Nadu, Kerala, AP, Telangana, Karnataka and Marathawada.

OLR upto 290-310 wm^{-2} was over central parts, upto 280 wm^{-2} was over north & south parts and upto 200 wm^{-2} was over extreme north & extreme south parts of country.

Jet Stream:

No Jet stream and a feeble trough is observed over north Rajasthan.

Dynamic Features:

A positive vorticity field is seen over Rajasthan, UP, central Maharashtra and coastal Karnataka . A weak wind shear is present over north part of country (North of 25 N) and medium to high wind shear is present over north-east parts of the country. Positive shear tendency is observed over central India and negative shear tendency is observed over rest parts of the India. Higher water vapour content is seen over SW J&K adjoining Pak and southern. states of T N & Kerala .

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Precipitation:**IMR:**

Rainfall upto 70 mm was observed over Kerala & adjoining west T N. Rainfall upto 20 mm was observed over central J&K, north H P and few places over south interior Karnataka & south TN . Rainfall upto 10mm was observed over rest J&K, rest H P , north Punjab, west Telangana adjoining Karnataka adjoining Marathwada and rest parts of south interior Karnataka & south T N .

HEM:

Rainfall upto 70 mm was observed over few places of NW HP,Kerala ,few places over south interior Karnataka and central coastal TN . Rainfall upto 14 mm was observed over west Telangana adjoining Karnataka adjoining Marathwada rest south interior Karnataka and south T N.

RADAR and RAPID observation:

Convection appears to be in progress with dBz >30 over Vidarbha adjoining Telengana, Himachal Pradesh adjoining Uttarakhand and J & K. in DWR Composite at 1600 IST.

RAPID product indicates that convection is in progress over Haryana and adjoining Rajasthan, Telangana, Coastal Andhra Pradesh, Himachal Pradesh, Uttarakhand, Vidarbha, South Madhya Pradesh Rayalaseema and Kerala.

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

No significant dust concentration observed over Arabian Peninsula and west Rajasthan. No significant change in dust concentration expected over northern India for next three days.

2. NWP MODEL GUIDANCE:

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

1. Weather Systems:

A feeble CYCIR extending up to 850 hPa over Maharashtra and adjoining areas in the analysis persists over the region for next 24 hours. A north-south oriented trough extending from Uttar Pradesh up to interior Karnataka over Madhya Pradesh and adjoining Vidarbha and Telangana establishes in day 1 forecast. Thereafter, the trough orients in north-east and southwest direction extending from Assam to interior Karnataka in day 2. Then, a north-south trough lies over Assam and adjoining areas extending up to Bay of Bengal persists during day 3 and 4. In day 4, a trough parallel to Himalayan barrier is seen extending from Delhi up to Jharkhand with embedded cyclonic circulations over Delhi and adjoining east Uttar Pradesh and over Jharkhand. The cyclonic circulation over Jharkhand moves north eastward over GWB with a little intensification in day 5.

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

The Jet at 500 hPa does not exist over most parts of India during next 5 days but strong westerly wind persists around 25°N latitude. The westerly reaches to the strength of Jet over Northeast India on day 2 day and day 5 during morning hours.

3. Low level Vorticity:-Positive Vorticity (>15x10⁻⁵/s):

Mainly along foothill of Himalaya during next 5 days with morning hour maxima. A significant vorticity zone associated with the trough lies over Central India from east Uttar Pradesh up to Interior Karnataka in day 1. The zone shifts eastward and orients in north-east and southwest direction in day 2 and 3 as the associated trough changes the orientation. The significant vorticity zone confines over north-eastern states, GWB and adjoining areas in 4 and 5.

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): Less than the threshold value all over the country during next 24 hours. Some pockets exceeding threshold lies over GWB and adjoining Orissa after day 2 and thereafter appears over Orissa and parts of coastal Andhra Pradesh till day 5.

Lifted Index (< -2): The areas with index less than threshold lies along east coast regions over GWB, Orissa, coastal Andhra Pradesh for next 5 days. The index also crosses threshold along the west coast over Kerala, parts of coastal Karnataka and Konkan-Goa in all 5 days. It reaches maximum negative value over Gangetic West Bengal and adjoining Orissa day 2 onwards. The significant zone is also seen over Rajasthan and adjoining Madhya Pradesh in day 2 which shifts eastward over Delhi and Uttar Pradesh and Madhya Pradesh in day 3.

Sweat Index (> 300): Significant areas lies over Vidarbha, Madhya Maharashtra, Telangana and adjoining areas for next 24 hours. Then zone is confined along east coast of India over GWB, Orissa and coastal AP with maximum values over GWB and Orissa in day 3 and 4. Another zone appears over Rajasthan in day 2 with moves eastward and merges with the zone along east coast in day 3.

Total Total Index (> 50) : Above threshold value over Gujarat, Maharashtra and adjoining Rajasthan and Madhya Pradesh at 12 UTC during next 3 days. The significant zone lies over Madhya Maharashtra, interior Karnataka and adjoining Vidarbha and Telangana for day 3 and 4. One zone appears over Rajasthan and adjoining Gujarat in day 5.

CAPE (> 1000): Mostly along east coast of India over Gangetic West Bengal, Orissa, coastal Andhra Pradesh and Tamilnadu coast during next 5 days. The CAPE values crosses threshold over Kerala and parts of coastal Karnataka, Konkan-Goa during evening hours. Maximum values are seen over GWB and Orissa and sometimes over Kerala.

CINE (50-150): Maximum CIN values are found in pockets along east coast over GWB, Odisha, coastal AP and Tamilnadu from Day-1 to Day-5. The zone sometime extends inland. CIN values are higher along west coast and coastal Gujarat and adjoining west Rajasthan.

5. Rainfall and thunderstorm activity:

10-40 mm rainfall seen over Kerala, adjoining Konkan & Goa and interior Karnataka during next 3 days with maximum rainfall in day 3. Some parts of J&K in day 1.

10-40 mm rainfall is likely over some areas over GWB and north-eastern states from day 3 to day 5.

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

1. Weather Systems:

Feeble trough in forecasts Day-0 to Day-4 at MSLP over J & K. weak CYCIR over east UP and adjoining Bihar in Day-3-4.

Wind discontinuity only in Day-0-4: at 925 and 850 hPa extends over parts of AP, Maharashtra, Odisha, Chhattisgarh and parts of Bihar.

Anticyclonic flow at 850 hPa over in Day-1&2 is over Bay of Bengal off AP coast and in Day-3 off Maharashtra coast.

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

In Day-4 over Bohar-WB and Bangladesh. Weaker magnitude during Day-0 to Day-3.

3. Convergence at 850 hPa:

Weak noisy low level convergence at several places over India

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

Weak noisy scattered in 12UTC on all days except Day-3-4

Day-0 to Day-3 at 18 and 00UTC: NS orientation over peninsula near 77E along the NS trough at 850 hPa shifting eastwards.

Day-3: 00 to 12UTC high values over NW India Rajasthan-MP and shifting eastwards to over eastern India.

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

Day-0-2: Parts of AP and Karnataka. NS orientation, covering Maharashtra and MP.

Day-2: TN and mainly NE India covering Manipur, Tripura, Mizoram, Meghalaya and Assam

Day-3-4: NS Odisha region extending NE-wards (on day4)

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

Day-0-2: Parts of AP and Karnataka. NS orientation, covering Maharashtra and MP.

Day-2: TN and mainly NE India covering Manipur, Tripura, Mizoram, Meghalaya and Assam

Day-3-4: NS Odisha region extending NEwards (on day4)

7. Spatial distribution of TTI: TTI >44 [Scattered Numerous Thunderstorms]:

Day-0-3: NS orientation, Central peninsula covering parts of Telangana, Karnataka, Maharashtra, MP, Chhattisgarh and Odisha (on day3)

Day3-Day-4 high values of TTI over NW India moving SE wards after Day-3.

8. Rainfall and thunder storm activity:

Day-0 -1: (>2cm/day) Parts of Arunachal and Tripura and Mizoram show rainfall > 4cm/day on day-3 to 5.

Day-4 (>4cm/day) rainfall over Bangladesh and adjoining WB and Tripura and Mizoram. (>8cm/day also likely)

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

1. Weather Systems:

A feeble and quasi-stationary CYCIR extending up to 850 hPa over Maharashtra coast and adjoining areas is seen in the analysis. A north-south trough extending over east UP, Madhya Pradesh is seen during day 1 which orients along east coast extending from Assam to interior Karnataka over GWB, Jharkhand, Chhattisgarh, Telangana and adjoining Vidarbha during day 2. The cyclonic circulations over north Madhya Pradesh and adjoining areas and over interior Karnataka are seen in day 3 along with associated feeble trough in between them over central India.

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

The Jet at 500 hPa does not exist over most parts of India during next 3 days but strong westerly wind persists around 25 deg. N latitude over GWB and north eastern states in next 2 days which weakens thereafter. In day 3, strong westerly is seen over Rajasthan and adjoining Northwest India.

3. Low level Vorticity :-Positive Vorticity (>15x10⁻⁵/s):

Mostly along foothills of Himalaya during morning hours of next three days. The significant vorticity zone is seen associated with the trough in the level. Day 2 onwards, the vorticity is significant over Rajasthan and adjoin Gujarat which advances eastward over Madhya Pradesh in day 3.

4. Model Reflectivity (Max. dBZ):

>25 dBz over J & K and adjoining Himachal Pradesh in day 1. Some parts of GWB, and north eastern states on day 2 and day 3. During day 3 over east Rajasthan and adjoining Delhi and Uttar Pradesh and north MP

5. Spatial distribution of Total Total Index, K-Index, CAPE and CINE [High potential for thunderstorm]:

Total Total Index (> 50) : Above threshold value mostly over most parts of India during next 3 days except parts of extreme south peninsular region and north-eastern states.

K-Index (> 35): Less than threshold value over most parts of India during next 3 days but significant values are seen over peninsular India and mostly over interior Karnataka and adjoining regions.

CAPE (> 1000): Mostly over Kerala, coastal Karnataka and Konkan & Goa during next 3 days. Another zone over coastal areas of GWB, Orissa, Andhra Pradesh and Tamilnadu.

CINE (50-150): CIN values are small all over India during all three days of forecasts except some places along coastal areas of India over Orissa, coastal AP, coastal Karnataka and Konkan-Goa. During day 3, over Rajasthan and adjoining Gujarat.

6. Rainfall activity:

Rainfall activity (~ 10-40 mm) in extreme south peninsular region over parts of Kerala and adjoining interior Karnataka and pockets of north-eastern states during next 3 days.

Rainfall ~10-40 mm over parts J&K and adjoining Himachal Pradesh during day 1.

3. IOPADVISORY FOR 24 and 48Hrs:

Summary and Conclusions:

Day 1 & Day 2:

Presently, the Western Disturbance as an upper air cyclonic circulation lies over north Pakistan & neighbourhood and extends upto 3.1 km above mean sea level. A trough runs from northeast Rajasthan to Gujarat region and extends upto 0.9 km above mean sea level. The upper air cyclonic circulation over North Interior Karnataka & neighbourhood now lies over North Interior Karnataka and adjoining south Madhya Maharashtra & Marathawada and extends upto 0.9 Km above mean sea level. Due to this system, Kerala and Interior Tamilnadu may experience rainfall activities with thunder squall. The trough in lower level easterlies from Maldives area to Coastal Karnataka now seen as wind discontinuity from Lakshadweep area to West Vidarbha across Interior Karnataka and Marathawada at 1.5 km above mean sea level which may result in Thundersquall activities over Karnataka, Telangana and South Chhattisgarh.

On Day 2- the trough is likely to weaken in next 48 hours and will decrease the rainfall amount over the said area.

24 hour Advisory for IOP:

Kerala and Interior Tamilnadu

Telangana, Interior Karnataka, Marathawada, South Chhattisgarh, Coastal Andhra Pradesh, Coastal Orissa and South Vidarbha

Lakshadweep

48 hour Advisory for IOP:

Kerala, Assam, Meghalaya, Tripura and Mizoram

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

ForIMDNWPproducts:(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

Upperlevelwinds

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

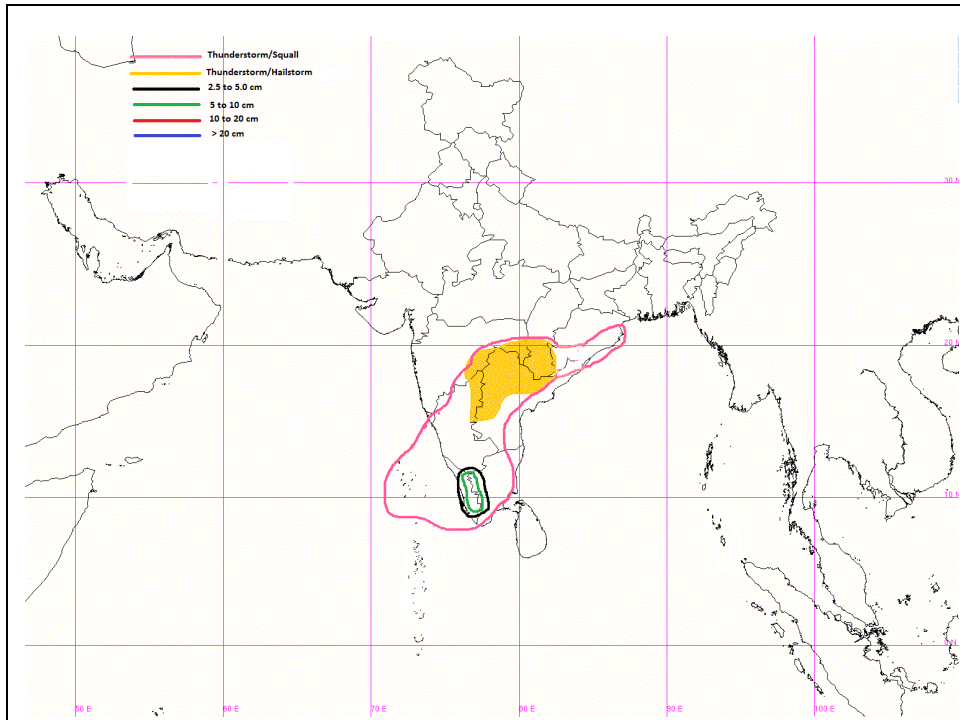
HEM:http://satellite.imd.gov.in/img/3Ddaily_he.jpg

ForRadarimagesofthepast24hoursincludingmosaicofimages:

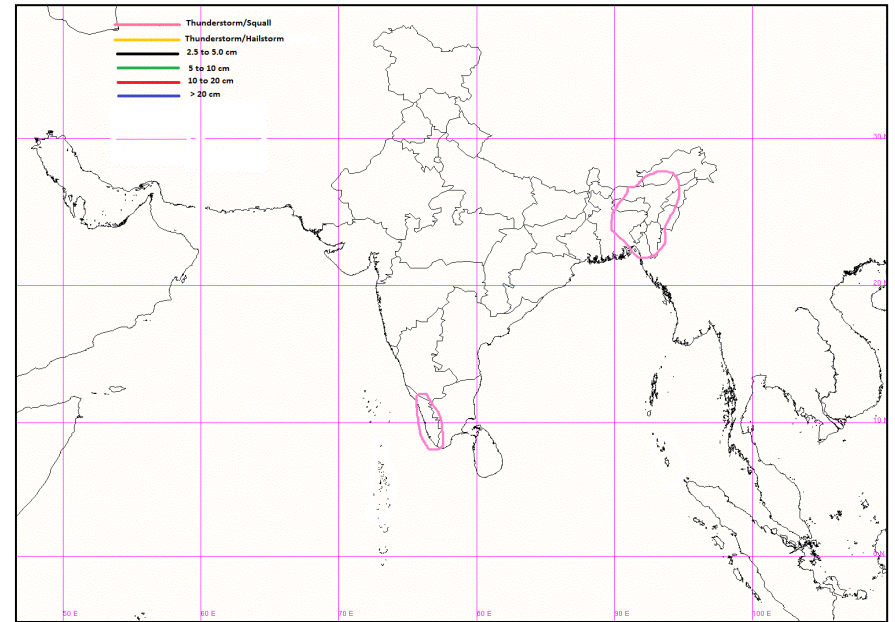
http://ddgmui.imd.gov.in/dwr_img/

Satellite sounder based T-Phi gram

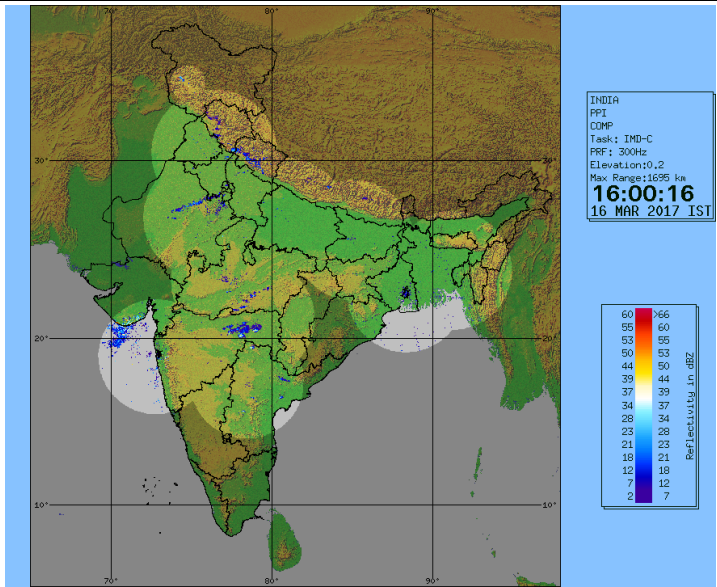
http://satellite.imd.gov.in/map_skm2.html



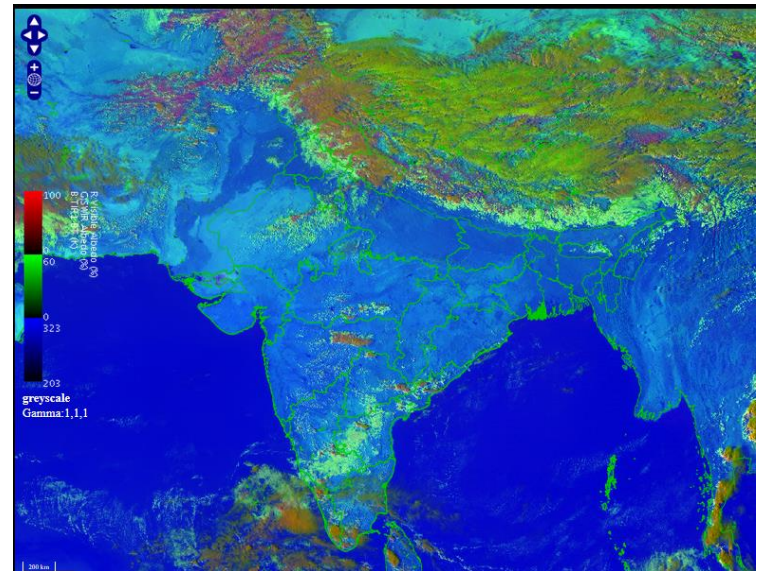
IOP Advisory for 24hours



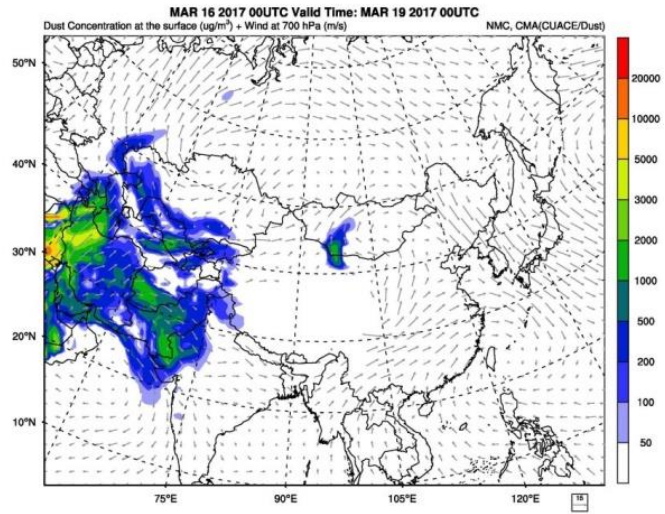
IOP Advisory for 48hours



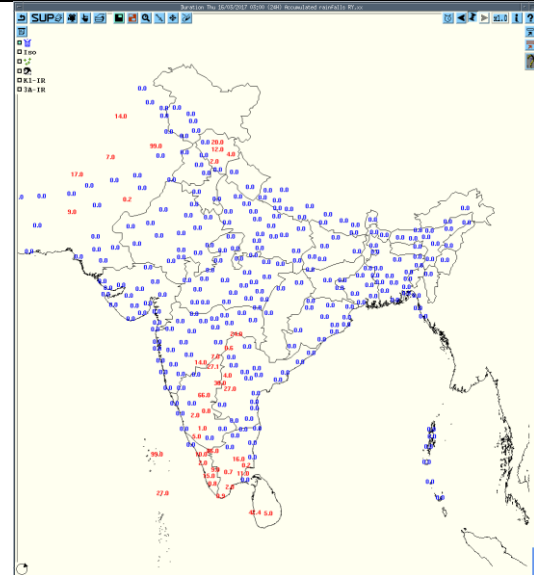
DWR Composite at 1600 IST of today



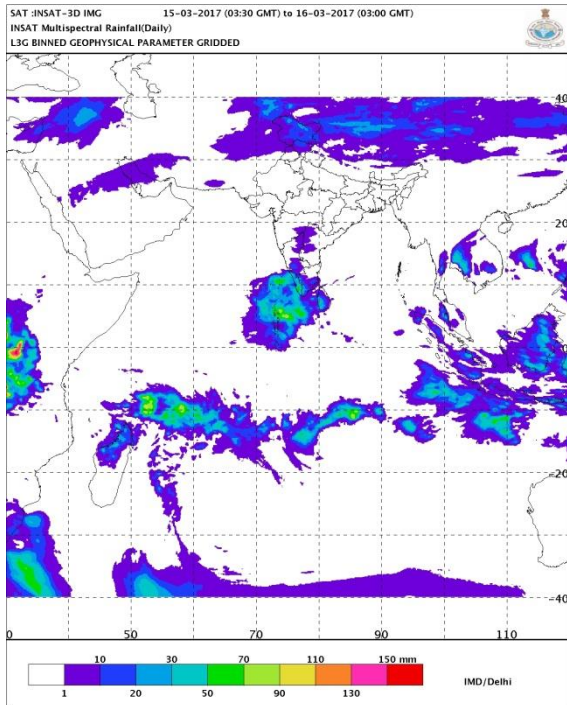
RGB Image of INSAT3D at 1530 IST of today



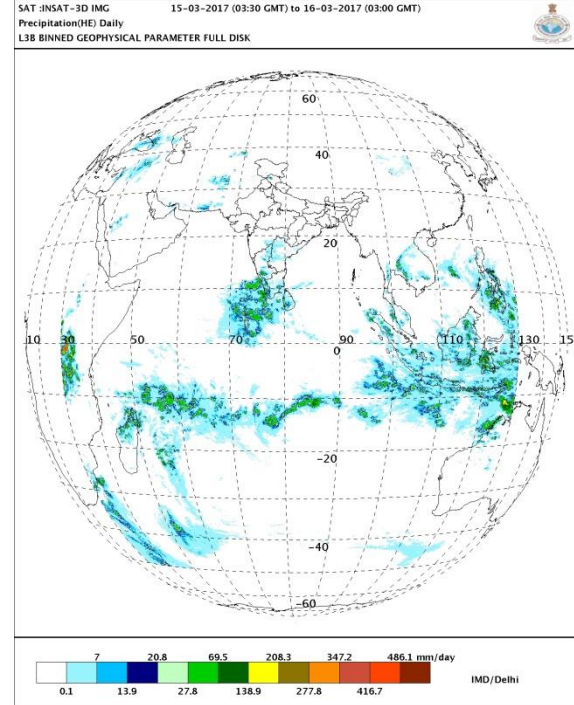
Forecast Dust Concentration at 00UTC of 19th March



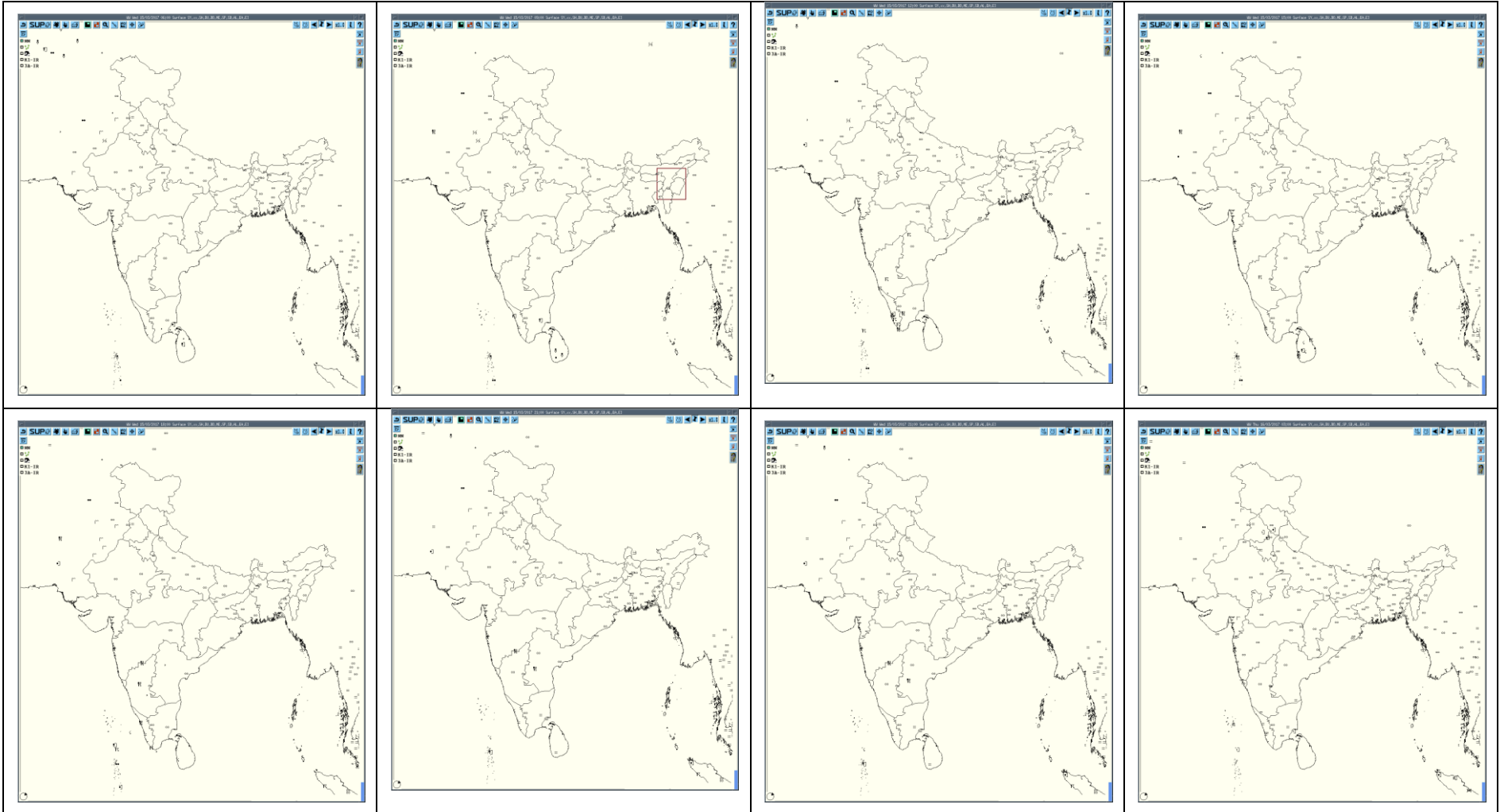
Accumulated 24 Hour rainfall (in red) recorded at 0300 UTC of today



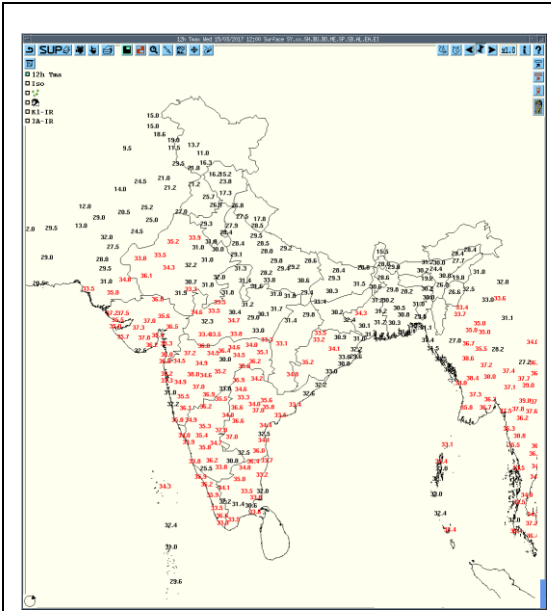
IMR Rainfall



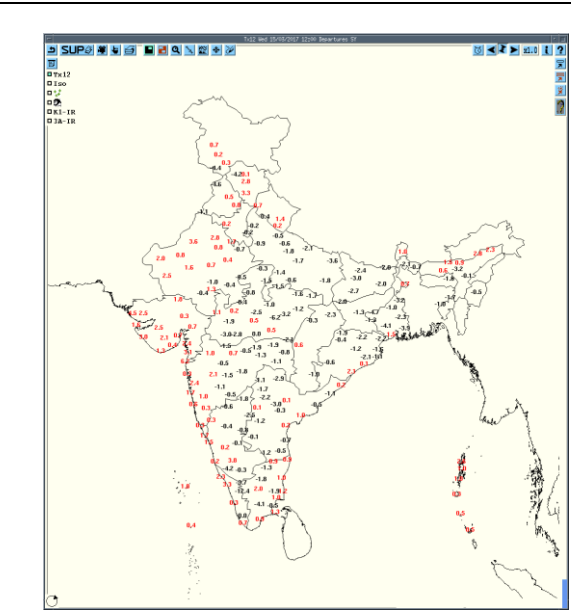
HEM Rainfall



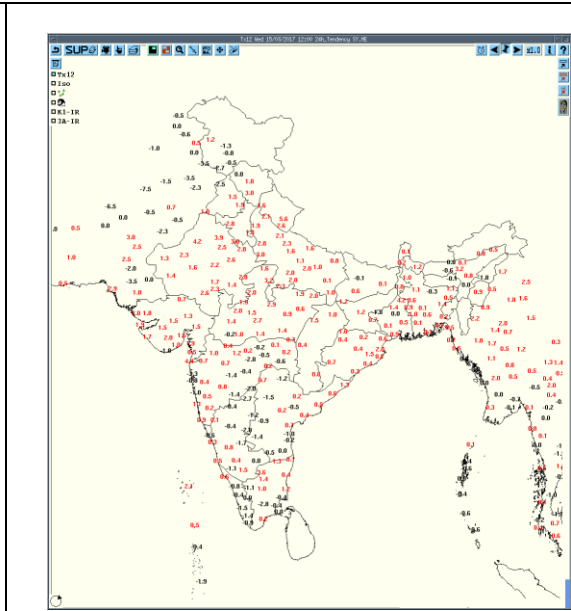
3hourly Past weather at 06, 09, 12, 15, 18, 21 UTC of yesterday and 00 & 03hrs UTC of today



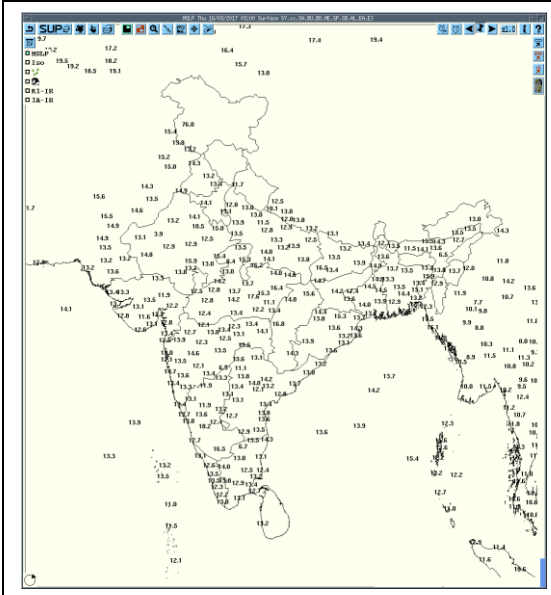
Tmax



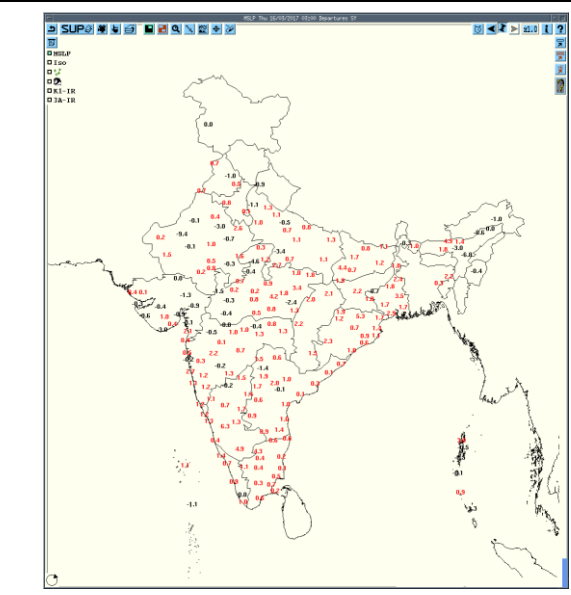
Departure Tmax



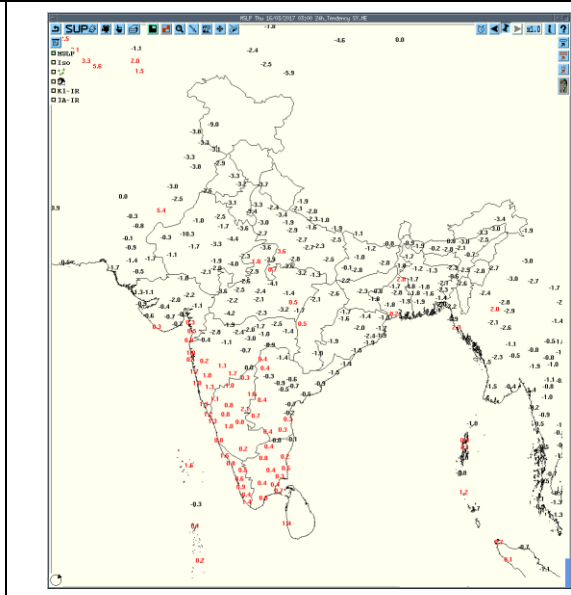
Tendency Tmax



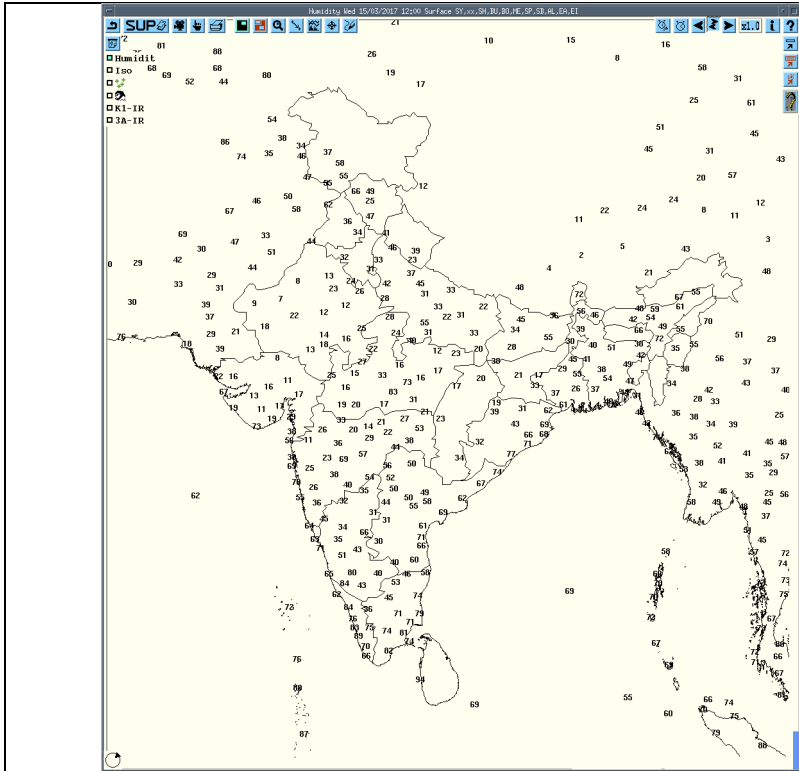
MSLP



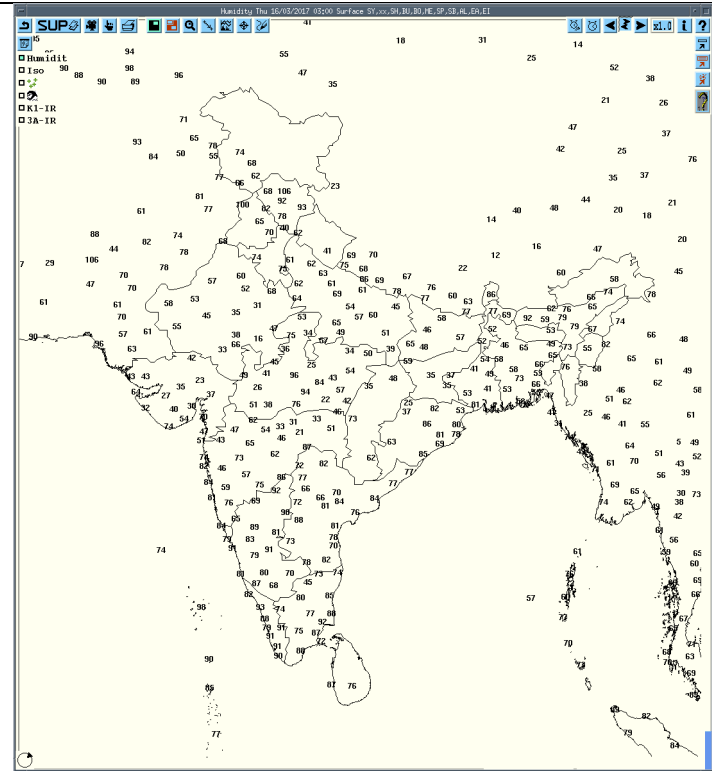
Departure MSLP



Tendency MSLP



RH 12 UTC yesterday



RH 03 UTC today

Realized weather past 24 hours

Date	Time of Reporting	Name of Station Reporting	Region	STATE	Weather Event
15-03-2017	0600UTC	Nil	Nil	Nil	Nil
15-03-2017	0900UTC	Kozhikode	South India	Kerala	Thunderstorm
15-03-2017	1200UTC	Nizamabad	South India	Andhra Pradesh	Thunderstorm
		Shimoga	South India	Karnataka	Thunderstorm
		Bajpe	South India	Karnataka	Thunderstorm
		Cochin	South India	Kerala	Thunderstorm
		Alapuzha	South India	Kerala	Thunderstorm
		Kottayam	South India	Kerala	Thunderstorm
		Punalur	South India	Kerala	Thunderstorm
		Thiruvananthapuram	South India	Kerala	Thunderstorm
		Kodaikanal	South India	Tamilnadu	Thunderstorm
15-03-2017	1500UTC	Gadag	South India	Karnataka	Thunderstorm
15-03-2017	1800UTC	Sholapur	West India	Maharashtra	Thunderstorm
		Gadag	South India	Karnataka	Thunderstorm
		Kozhikode	South India	Kerala	Thunderstorm
		Thiruvananthapuram	South India	Kerala	Thunderstorm
		Minicoy	South India	Lakshadweep	Thunderstorm
15-03-2017	2100UTC	Sholapur	West India	Maharashtra	Thunderstorm
		Kurnool	South India	Andhra Pradesh	Thunderstorm
16-03-2017	0000UTC	Nil	Nil	Nil	Nil
16-03-2017	0300UTC	Nil	Nil	Nil	Nil

Name of Station Reporting	Region	STATE	Weather Event	Date	Time of Commencement (IST)	Time of end (IST)
Nizamabad	South India	Andhra Pradesh	TSRA	15-03-17	1715	1950
Hyderabad	South India	Andhra Pradesh	TS	15-03-17	2335	2400
Kurnool	South India	Andhra Pradesh	TSRA	16-03-17	0208	0405
Bengaluru KIAL	South India	Karnataka	TSRA	14-03-17	1755	2015
Madikeri (43287)	South India	Karnataka	TSRA	14-03-17	1615	2030
Alappuzha	South India	Kerala	TSRA	15-03-17	1717	1800
Karipur AP	South India	Kerala	TSRA	15-03-17	1425 1500	2250 0030
Thiruvananthapuram AP	South India	Kerala	TSRA	15-03-17	1530 2322	1835 0050
Thiruvananthapuram City	South India	Kerala	TSRA	15-03-17	1435	1450
Agathi	South India	Lakshadweep	TSRA	16-03-17	0230	0830

TS Thunderstorm,
TSRA Thunderstorm with Rain

Severe Weather warning based on DWR observation


Name of issuing Radar station	DWR PATNA
Geo-coordinates of issuing Station(Lat, Long,Alt)	--
Date and time of issue in UTC (yyyyMMddhhmm)	201703150700
Nature of severe weather expected	Nil
Name of issuing Radar station	DWR KARAİKAL
Geo-coordinates of issuing Station(Lat, Long,Alt)	Lat:10.91381N,Long:79.84141E/Alt:25masl
Date and time of issue in UTC (yyyyMMddhhmm)	DWRU/S
Nature of severe weather expected	--
Name of issuing Radar station	DWR NAGPUR
Geo-coordinates of issuing Station(Lat, Long,Alt)	Lat:21.1458°N,Long:79.0882°E
Date and time of issue in UTC (yyyyMMddhhmm)	201703150600
Nature of severe weather expected	
Name of issuing Radar station	DWR MUMBAI
Geo-coordinates of issuing Station(Lat, Long,Alt)	Lat-18°54'04",Long-72°48'32"/HeightAMSL-3.22meters.
Date and time of issue in UTC (yyyyMMddhhmm)	
Nature of severe weather expected	
Name of issuing Radar station	DWR HYDERABAD
Geo-coordinates of issuing Station(Lat, Long,Alt)	Lat-17.2562°NLong-78.7656°E
Date and time of issue in UTC (yyyyMMddhhmm)	201703160640
Nature of severe weather expected	Moderate TS
Districts/ Talukas/ Mandals/ Blocks likely to be	Otnoor / Manchieryal in Adilabad Dist
Name of issuing Radar station	DWR AGARTALA
Geo-coordinates of issuing Station(Lat, Long,Alt)	23.89°N,91.25°E,16mabovemsl
Date and time of issue in UTC (yyyyMMddhhmm)	201703150700
Nature of severe weather expected	Nil
Name of issuing Radar station	DWR KOLKATA
Geo-coordinates of issuing Station(Lat, Long,Alt)	22.5705° N / 88.353° E, 7m above msl
Date and time of issue in UTC (yyyyMMddhhmm)	201703150641
Nature of severe weather expected	Nil

Past 24 hrs RADAR Report

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	15/03/17	0752UTC-0932 UTC	ISOLATED CELL WITH HEIGHT 8.0 KM WITH MAX. REFLECTIVITY 40.5 DBZ	Convection cloud formation started at 0752 UTC SSW of DWR at range of 203 Kms moving W`ly and disorganized at 0952 UTC	No signature of thunderstorm & hail warning in QLW	RA/SHRA/TSRA	ADILABAD IN TELANGANA
	15/3/2017	2052-2232 UTC	ISOLATED CELL WITH HEIGHT 7.0 KM WITH MAX. REFLECTIVITY 33.0 DBZ	Convection cloud formation started at 2052 UTC South of DWR at range of 205 Kms moving W`ly and disorganized at 2232 UTC	No signature of thunderstorm & hail warning in QLW	RA/SHRA	NANDED & HINGOLI IN MAHARASTRA
	16/03/17	0112 UTC-0252 UTC	ISOLATED CELL WITH HEIGHT 8.2 KM WITH MAX. REFLECTIVITY 41.0 DBZ	Convection cloud formation started at 0112 UTC south of DWR at range of 170 Kms and deorganised at 0252 UTC	No signature of thunderstorm & hail warning in QLW	RA/SHRA/TSRA	ADILABAD IN TELANGANA NANDED & HINGOLI IN MAHARASTRA

∞	haze
☁	smoke
☼	dust or sand storm
☁	fog
☂	drizzle
•	rain
✪	snow
☁	showers
☁	hail
☁	thunderstorm
Weather Symbols	


+ thunderstorm



+ heavy thunderstorm


sandstorm or dust storm


squall


hail shower


tropical storm


+ tornado


+ lightning


+ hurricane

www.visualdictionaryonline.com