



India Meteorological Department
FDP STORM Bulletin No. 25(30-03-2017)

1. CURRENT SYNOPTIC SITUATION at 0300 UTC of 25-03-2017:

SYNOPTIC FEATURES:

The Western Disturbance as an upper air cyclonic circulation over North Pakistan & neighbourhood now lies over eastern parts of Jammu & Kashmir & neighbourhood at 3.1 km above mean sea level.

Another western disturbance as a trough in mid & upper-tropospheric westerlies with its axis at 7.6 km above mean sea level roughly along longitude 50.0°E and north of latitude 30.0°N now runs roughly along longitude 58.0°E and north of latitude 30.0°N.

The upper air cyclonic circulation over North Interior Karnataka & neighbourhood now lies over North Interior Karnataka and adjoining south Madhya Maharashtra between 0.9 km and 1.5 km above mean sea level.

Wind discontinuity runs from comorin area to South Interior Karnataka across interior Tamilnadu and extends upto 0.9 km above mean sea level.

An east-west trough runs from Bihar to Nagaland across Bangladesh and Assam & extends upto 1.5 km above mean sea level. The upper air cyclonic circulation over northern parts of West Bengal & neighbourhood now lies over Bangladesh and adjoining northern parts of West Bengal and extends upto 0.9 km above mean sea level and this upper air cyclonic circulation is now embedded with the above east west trough.

The upper air cyclonic circulation over south Chhattisgarh & adjoining Odisha at 0.9 km above mean sea level has become less marked.

The north-south trough from Sub-Himalayan West Bengal to northwest Bay of Bengal across Gangetic West Bengal between 2.1 km and 3.1km above mean sea level has become less marked.

SATELLITE OBSERVATIONS during past 24hrs and current observation:

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

Scattered multi-layered clouds were seen over J & K in association with western disturbance over the area.

Scattered low/medium clouds with embedded moderate to intense convection were seen over Arunachal Pradesh, Nagaland (Minimum CTT -52deg C), east Meghalaya adjoining Assam, Manipur, north Mizoram (minimum CTT -58deg C). Scattered low/medium clouds with embedded weak to moderate convection were seen over Bay Islands. Scattered low/medium clouds were seen over Himachal Pradesh, Uttarakhand, Maharashtra, south Chhattisgarh, south Odisha, north Bihar, Sub-Himalayan west Bengal, Sikkim, rest north-eastern states, Telengana, north coastal Andhra Pradesh, Karnataka, Kerala and Tamilnadu. Scattered medium/high clouds over Punjab, north Haryana and northwest Rajasthan.

Arabian Sea:

Scattered low/medium clouds with embedded moderate to intense convection were seen over Comorin & neighbourhood.

Bay of Bengal & Andaman Sea:

Scattered low/medium clouds with embedded isolated weak to moderate convection were seen over southeast Bay of Bengal and south Andaman Sea.

Convection: Light to moderate convection was observed over North East parts of India.

OLR: - . Up to 230 w m^{-2} was over J & K North Himachal Pradesh, North Uttarakhand, Sikkim and North East states.

Jet Stream: No Jet stream and no trough observed over India.

Dynamic Features: A positive Vorticity field is seen over Uttarakhand, Uttar Pradesh, Bihar, West Bengal, Coastal Karnataka, Marathwada and Saurashtra. Moderate wind shear observed over North India , Low wind shear observed over south adjoining central India and weak to moderate wind shear observed over rest parts of India .

Positive shear tendency observed over west and south India .Negative shear tendency observed over North East India.

Positive Low Level Convergence is observed over Marathwada and Coastal Odisha.

Precipitation:

IMR: Rainfall upto 50mm was observed over Manipur, Mizoram, Tripura Extreme South Assam. Rainfall upto 20mm was observed over Arunachal Pradesh , Nagaland. Rainfall upto 10mm was observed over North J&K North East Assam .

HEM: Rainfall upto 70mm was observed over Arunachal Pradesh, Nagaland Manipur, Mizoram and Tripura extreme South Assam.

RADAR and RAPID observation:

Significant convection was seen in DWR Composite at 1700UTC over South Assam adjoining Manipur, Tripura and adjoining Bangladesh.

RAPID RGB Satellite imagery of 1630 UTC also indicates the isolated convective clouds over South Assam adjoining Manipur, Tripura and Mizoram, south Tamilnadu and south Madhya Maharashtra.

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

No significant dust concentration observed over Arabian Peninsula and west Rajasthan. Dust concentration is expected not to increase over northern India for next three days.

2. NWP MODEL GUIDANCE:

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

- 1. Weather Systems:** 12UTC Charts on all days from Day0-4 show feeble trough in MSLP over J & K; which is not seen at 00UTC. From Day-2 onwards weak CYCIR over Sea SE of Srilanka
12UTC charts on all days from Day0-2: show Wind discontinuity at 925 hPa: W-E; Maharashtra, Telangana and Odisha
12UTC charts on all days from Day3-4: show Wind discontinuity at 925 hPa weakening and formation of a col region over Telangana. This is also evident at 850 hPa.
00UTC charts on Day-1-Day-2 show weak CYCIR over Bihar & WB region at 925 and 850 hPa.
850hPa anticyclonic flow lies over Oman is moving towards Arabian Sea in day 3 -4
- 2. Location of jet and jet core at 500hPa:-500hPa Jet core (>60kt):** Weak in magnitude on all Days.
Well defined anticyclonic flow over central India moving towards SE as day progresses reach over Bay of Bengal in day 2.
Fresh anticyclone was seen over west Arabian Sea on day 4.
- 3. Convergence at 850 hPa:** At 12UTC on all days: Strong low level convergence in land all along the west coast and isolated regions over Odisha. Day-1 and Day3-4 over parts of Assam/Meghalaya
- 4. Low level Vorticity:-Positive Vorticity (>15 x 10⁻⁵/s):** at 12UTC on all days over parts of Assam and Meghalaya.
On Day0, 1 & 2: Strong over northern UP & Bihar.
At 00UTC: on all days along the line of low level confluence. Northern part of UP associated with weak CYCIR Day-2.
- 5. Showalter Index: -3 to -4[Very unstable]:** Day-0: Isolated location over coastal Maharashtra , Goa, Kerala and J&K.
Day-1-2: Isolated location over coastal Maharashtra, Goa, coastal Karnataka, Kerala, parts of J&K and in NE over Meghalaya, Tripura and Arunachal.
Day-3: Goa, coastal Karnataka, Kerala, some parts of Telangana and NE India
Day 4: Over Odisha, east UP, Bihar and NE India
- 6. K-Index :> 35[Very Unstable thunderstorm likely]:**
Day 0-4: Parts of NE India
Day-0-4: Isolated location over coastal Maharashtra, Goa, coastal Karnataka, Kerala and parts of Odisha.
Day-3to4: Isolated location over Kerala , parts of TN. Day 4: Parts of Bihar, AP and coastal Odisha
- 7. Spatial distribution of TTI: TTI >50 [Scattered Thunderstorms few severe]:** Day 0-1: Along the coast of Maharashtra and Karnataka. All the day: Parts of J & K region.
From Day 3-4: extending along the line of low level convergence over MP, Chhattisgarh, Odisha and WB.
Day-3: Over parts of west UP, Delhi NCR. Day 4: Parts of Bihar
- 8. Rainfall and thunder storm activity:** Day-0&1: (>4cm/day) Tripura, Manipur, Mizoram, Meghalaya and adjoining Assam
Day-2,3 and 4 (>4cm/day) most part of NE India. Day 5: Some parts of J&K

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

1. Weather Systems: 00 UTC analysis shows CYCIR over UP, Bihar, GWB and adjoining areas. The trough from this system extends to coastal Odisha through WB and is persisting till 4th day.

2. Location of jet and jet core at 500 hPa:-500 hPa Jet core (>60kt): The Jet at 500 hPa is observed over Bihar, GWB and adjoining areas. The jet core is also observed over few pockets in Bihar during the 4th day.

3. Low level Vorticity:-Positive Vorticity 850hPa (>12 x 10⁻¹/s): Analysis shows the low level positive vorticity mainly along foothill of Himalayas, over east UP, GWB and few pockets of Maharashtra. Vorticity is prominent till 2nd day along the foothill of Himalayas. Isolated pockets over Maharashtra, Karnataka and NE states observe the positive vorticity from 3rd day till 5th day.

The significant vorticity zones associated with the cyclonic circulations are seen over GWB and over few pockets in Odisha in the morning hours.

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 zones are noticed over GWB, Odisha, Jharkhand, Bihar, eastern coast adjoining Bangladesh and Konkan & Goa during next 4/5 days.

Lifted Index (< -2): The areas with index less than -2 lies along east coast regions, GWB, Odisha, coastal AP, Bihar and adjoining areas with gradually the LI areas with less than -2 mainly extended towards south-eastern coastal regions and west costal region of India.

Sweat Index (> 400): The significant zones are confined along east coast of India over Andhra coast, GWB, Odisha, Bangladesh and adjoining regions. Some parts of western Gujarat states and Karnataka coast along with few pockets in West Bengal also indicated the value > 400 K for next 5 days and isolated place of J & K also show > 400K index value during next 5 days.

Total Total Index (> 50): Above threshold value in most parts of central India and adjoining northern parts of India from day 1 to day 4 particularly at 12 UTC of each day.

CAPE (> 1000): Mostly along east coast of India over Gangetic West Bengal, Odisha, Bihar, Jharkhand and adjoining regions during next 5 days. The CAPE values above threshold values are also observed over Kerala and parts of coastal Karnataka, Konkan-Goa.

CINE (50-150): Maximum CINE values are found in some areas along east coast over GWB, Odisha, coastal AP and Tamil Nadu and also over Bihar, Jharkhand and Goa & Konkan from Day-1 to Day-5 and Maximum CIN value over Gujarat region during next day 3 to day 5.

Maximum CIN values are found in some areas along east coast over GWB, Odisha, coastal AP and Tamil Nadu and also over Bihar, Jharkhand and Goa & Konkan from Day-1 to Day-5 and Maximum CIN value over Gujarat region during next day 3 to day 5.

5. Rainfall and thunderstorm activity: 10-40 mm rainfall shows over isolated place of NE States, the rainfall over NE states likely to continue during subsequent 4 to 5 days.

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

1. Model reflectivity (Max. dBz): (>25 dBz) Model reflectivity exceeding the threshold value, is seen over isolated pockets in north eastern states and J & K region in evening at day1. hours

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

Total Total Index (> 50) Above threshold values is observed over most parts of India during next 3 days except parts of extreme south peninsular region, West Bengal and north-eastern states and J & K.

K-Index (> 35): Less than threshold value over most parts of India during next 3 days.

CAPE (> 1000): Mostly along east coast of India over Andhra Pradesh, Odisha, and GWB during next 3 days, another zone along west coast over Kerala, coastal Karnataka and Konkan & Goa during next 3 days.

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

3. Rainfall activity: Rainfall activity (~ 10-40 mm) over NE states is expected to persist till next 3 days.

3. IOP ADVISORY FOR 24 and 48Hrs:

Summary and Conclusions:

Day 1 & Day 2:

Presently, an east west trough runs from Bihar to Nagaland across Bangladesh and Assam & extends upto 1.5 km above mean sea level which may result heavy rainfall over Assam, Meghalaya, Nagaland, Manipur and Tripura with Thunderstorm and hail/squall possibility on Day-1. The upper air cyclonic circulation over northern parts of West Bengal & neighbourhood now lies over Bangladesh and adjoining northern parts of West Bengal and extends upto 0.9 km above mean sea level and this upper air cyclonic circulation is now embedded with the above east west trough due to which rainfall activity may continue over the same area on Day-2.

The guidance from the NWP model output from ECMWF, IMD1534 and NCEP,IITM GFS,NCUM,NEPS and Satellite imageries are also suggesting the similar area of rainfall activities on Day1 and Day2.

24 hour Advisory for IOP:

Assam, Meghalaya,
Nagaland, Manipur, Mizoram and Tripura

48 hour Advisory for IOP:

Assam, Meghalaya, Nagaland, Manipur, Mizoram and Tripura

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

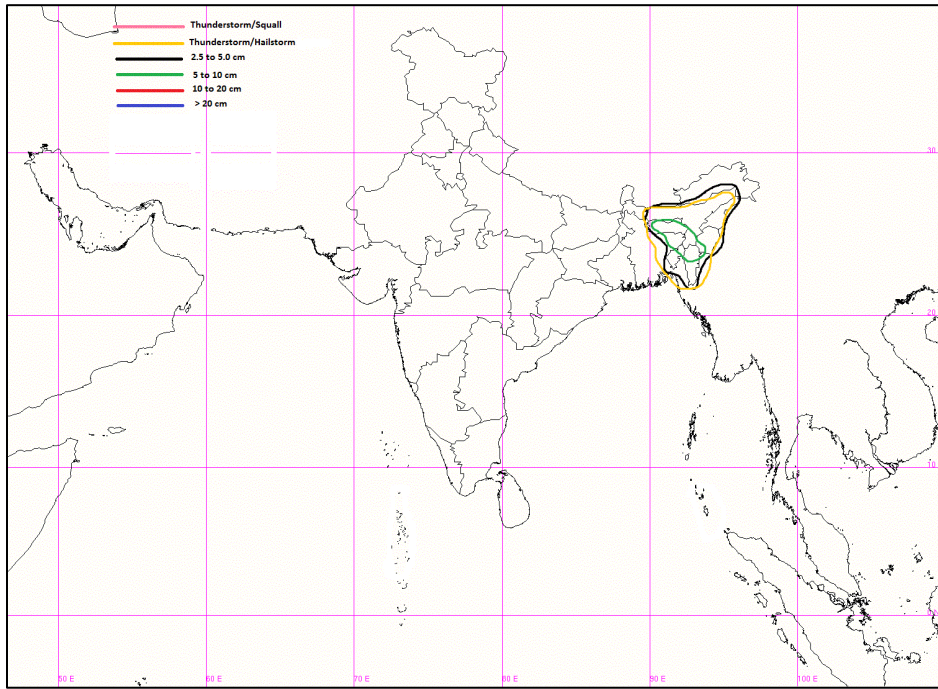
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ForRadarimagesofthepast24hoursincludingmosaicofimages:

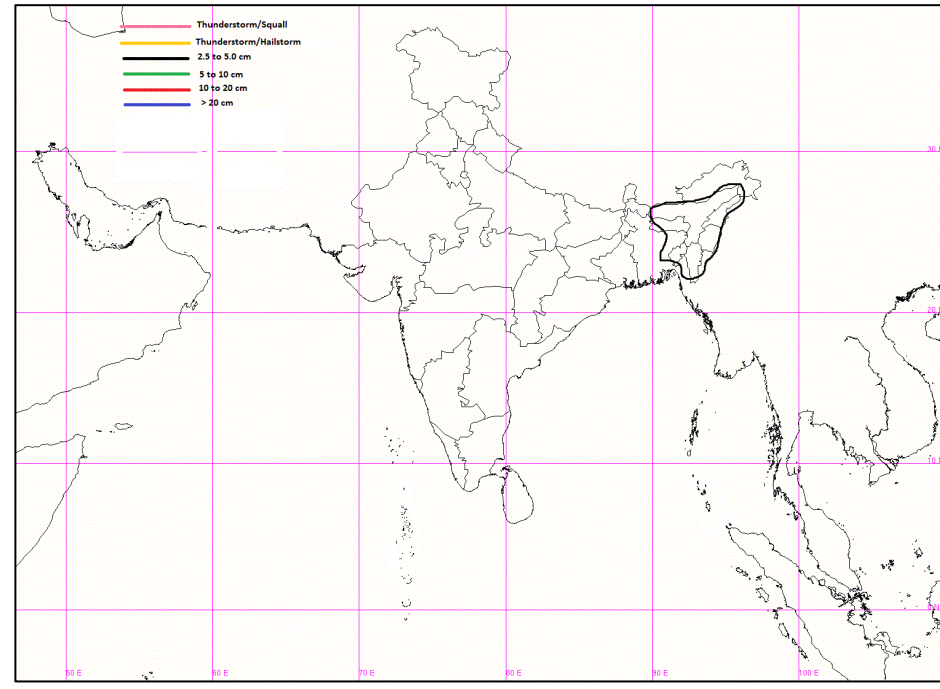
http://ddgmui.imd.gov.in/dwr_img/

Satellite sounder based T-Phi gram

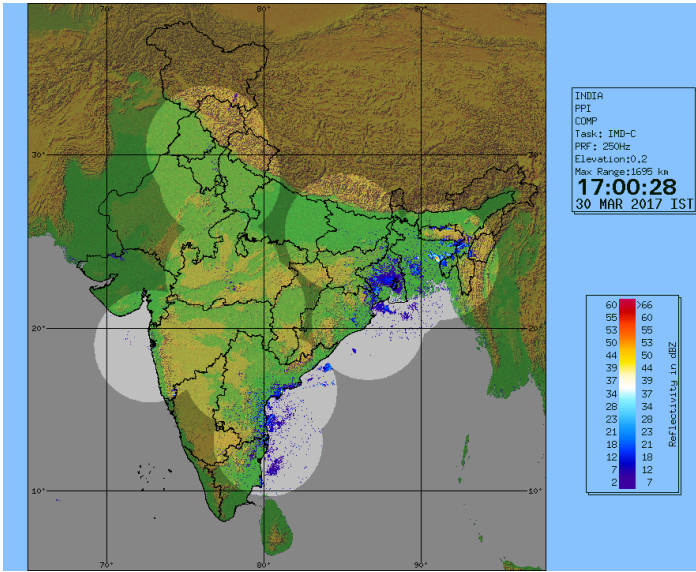
http://satellite.imd.gov.in/map_skm2.html



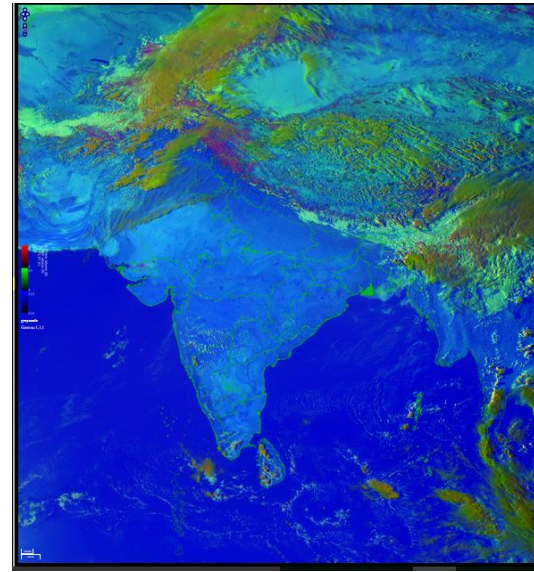
IOP Advisory for 24 hours



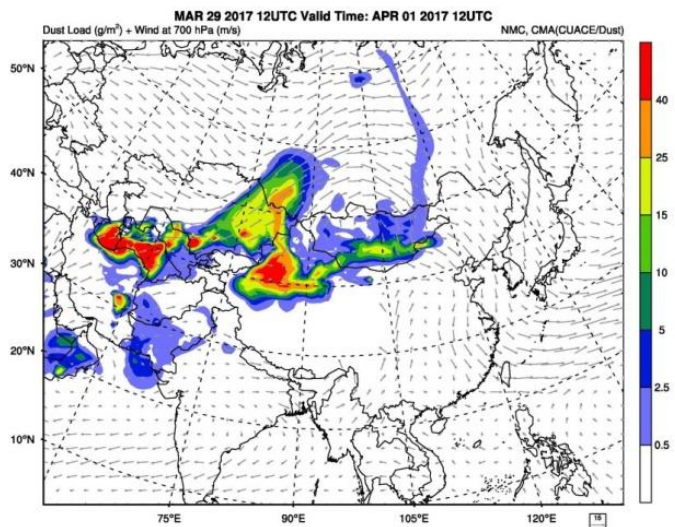
IOP Advisory for 48 hours



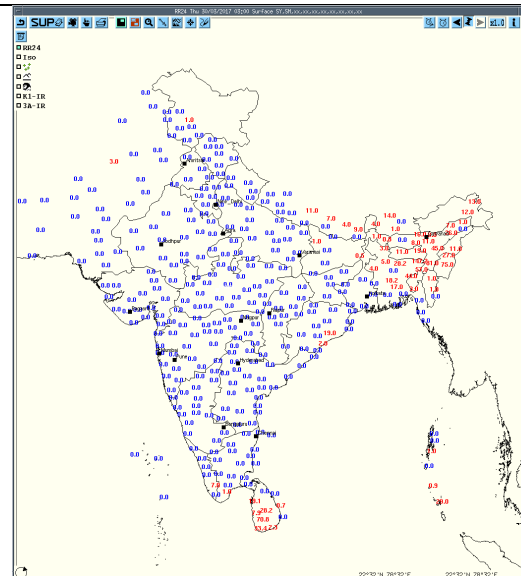
DWR Composite at 1700 hrs IST



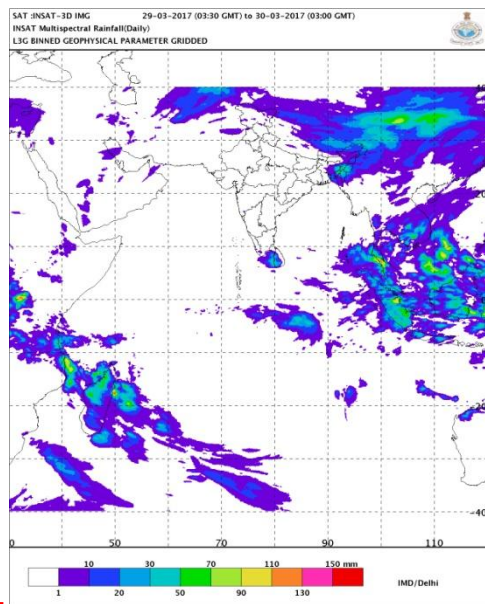
RGB Image of INSAT 3D at 1630 hrs IST



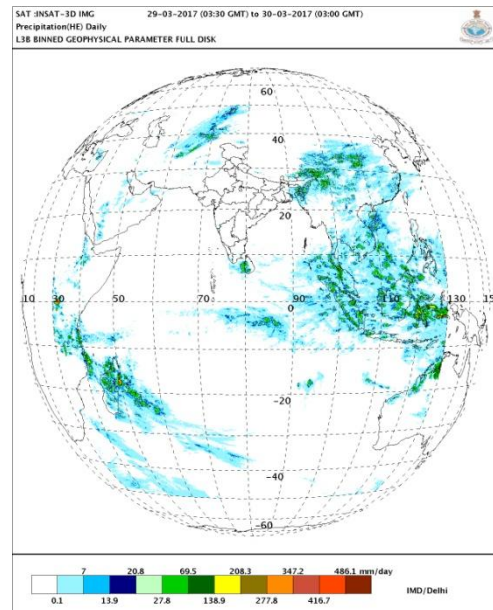
Forecast Dust Concentration at 12 UTC of 01 April



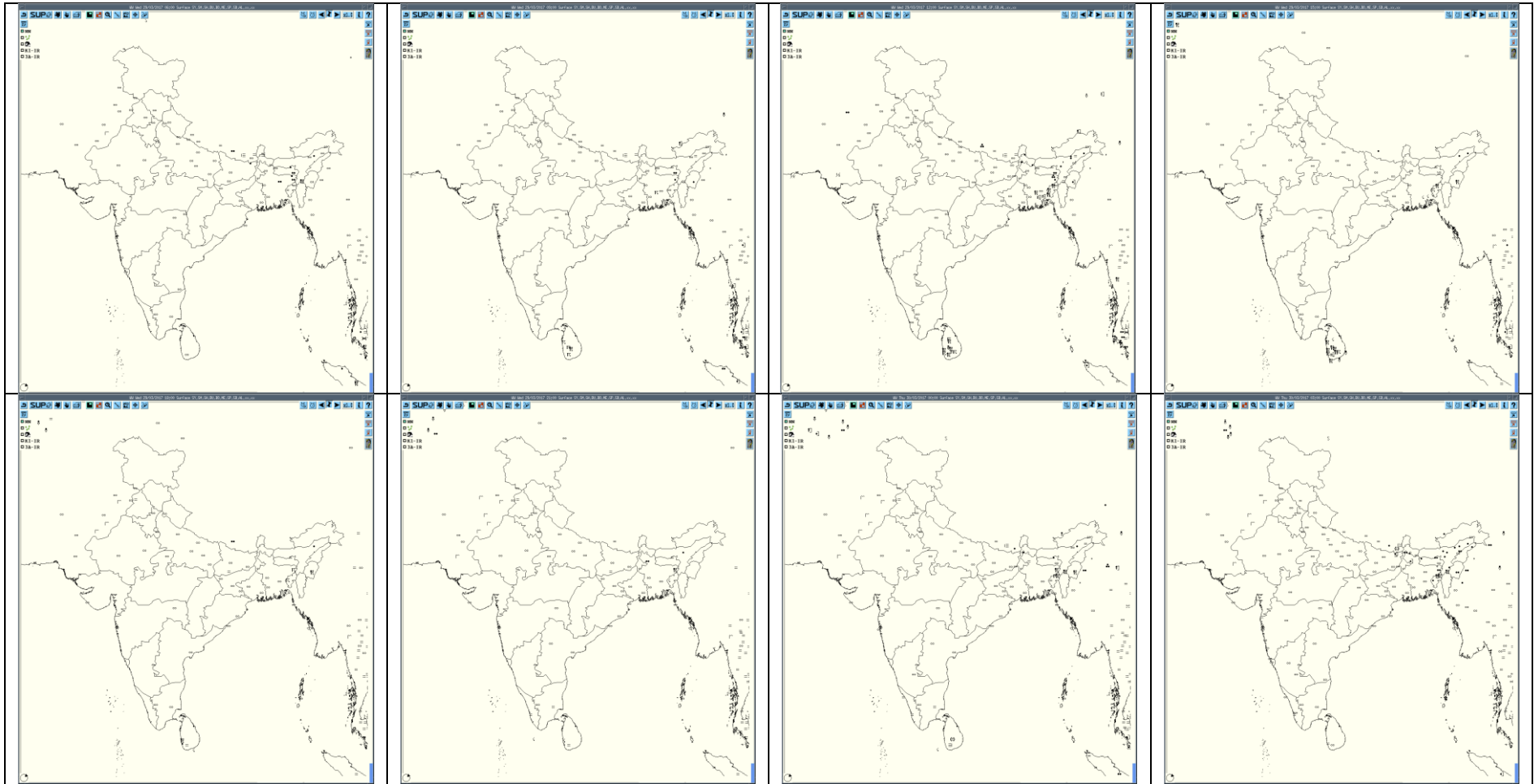
Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today



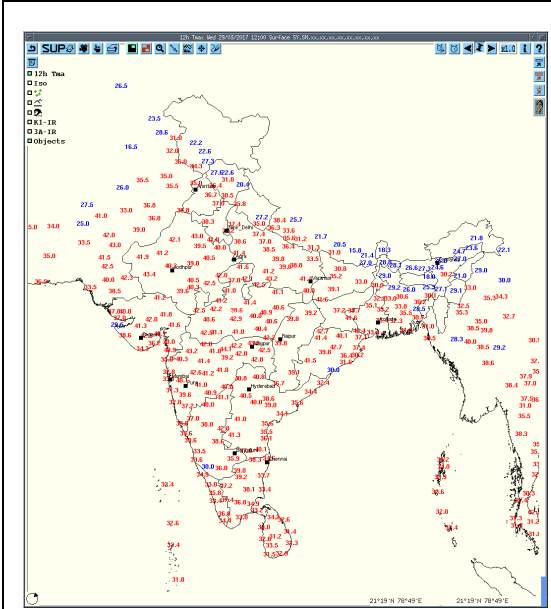
IMR Rainfall



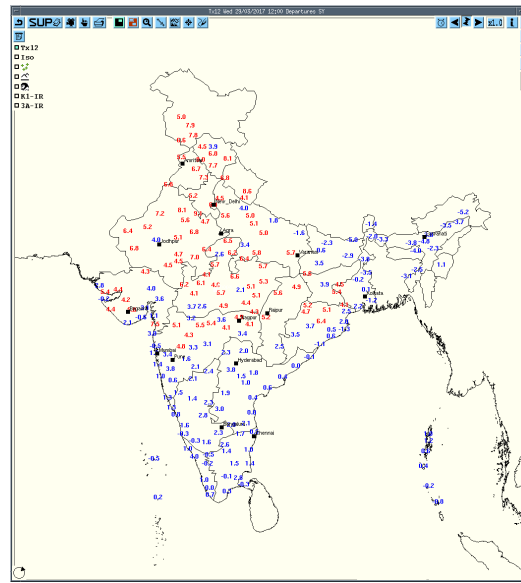
HEM Rainfall



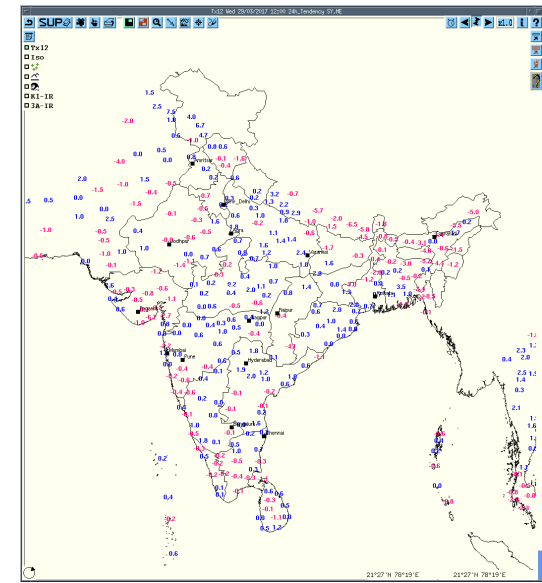
3hourly Past weather at 06, 09, 12, 15, 18, 21UTC of yesterday and 00 & 03 hrs UTC of today



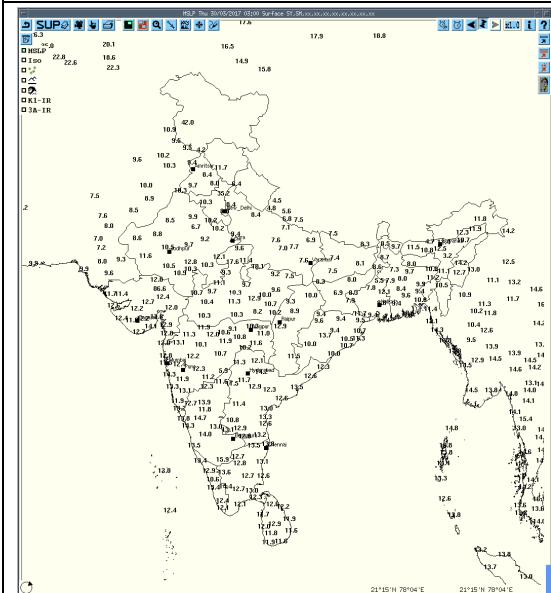
Tmax



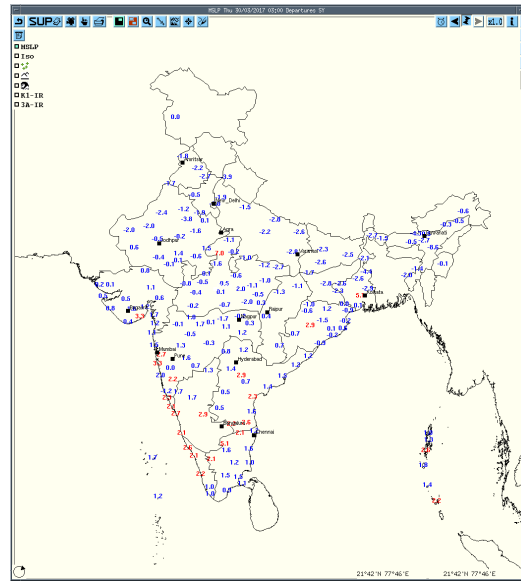
Departure Tmax



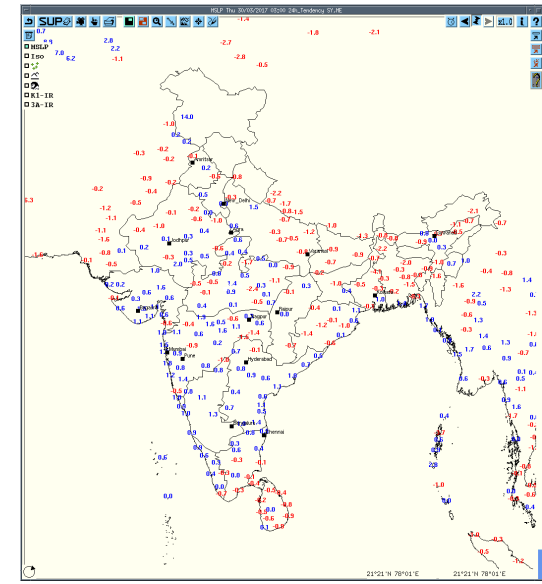
Tendency Tmax



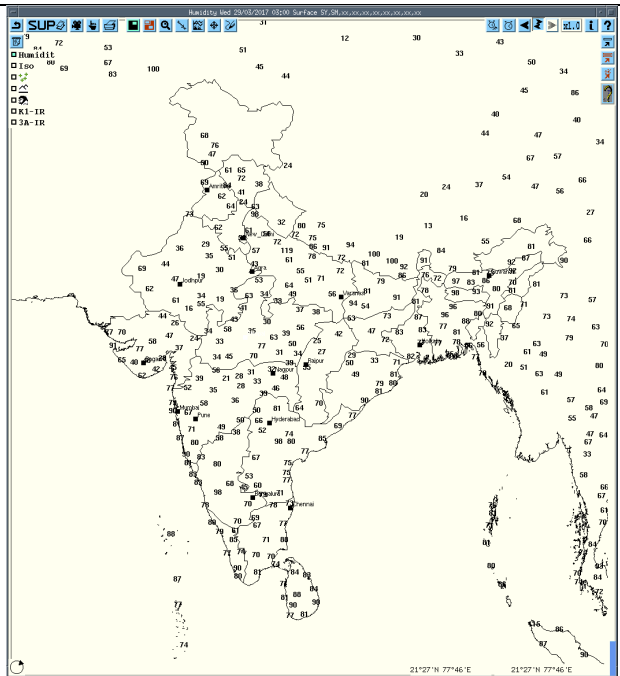
MSLP



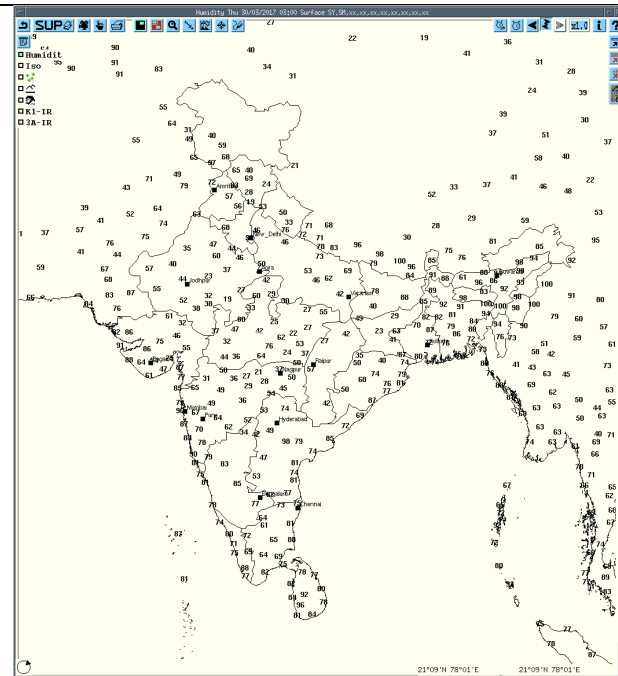
Departure MSLP



Tendency MSLP



RH at 12UTC yesterday



RH at 03UTC today

Realized weather past 24 hours (based on SYNERGIE data)					
Date	Time of Reporting	Name of Station Reporting	Region	STATE	Weather Event
29-03-2017	0600UTC	Nil	Nil	Nil	Nil
29-03-2017	0900UTC	Nil	Nil	Nil	Nil
29-03-2017	1200UTC	Nil	Nil	Nil	Nil
29-03-2017	1500UTC	Imphal	Northeast India	Manipur	Thunderstorm
		Agartala	Northeast India	Tripura	Thunderstorm
29-03-2017	1800UTC	Imphal	Northeast India	Manipur	Thunderstorm
		Agartala	Northeast India	Tripura	Thunderstorm
29-03-2017	2100UTC	Nil	Nil	Nil	Nil
30-03-2017	0000UTC	Silchar	Northeast India	Assam	Thunderstorm
		Imphal	Northeast India	Manipur	Thunderstorm
		Kailashahar	Northeast India	Tripura	Thunderstorm
30-03-2017	0300UTC	Silchar	Northeast India	Assam	Thunderstorm
		Kailashahar	Northeast India	Tripura	Thunderstorm

Name of Station Reporting	Region	STATE	Weather Event	Date	Time of Commencement (IST)	Time of end (IST)
Jorhat	Northeast India	Assam	Thunderstorm	29/30-03-17	29/2230	30/0200
Silchar	Northeast India	Assam	Thunderstorm	29-03-17	29/1120	29/1350
				29/30-03-17	29/1831	30/0831
Imphal	Northeast India	Manipur	Thunderstorm	29/30-03-17	29/2015	30/0550
Lengpui	Northeast India	Mizoram	Thunderstorm	29/30-03-17	30/0530	30/0830
Kailasahar	Northeast India	Tripura	Thunderstorm	29/30-03-17	29/1750	30/0830
Agartala	Northeast India	Tripura	Thunderstorm	29/30-03-17	29/1725	30/0450

TS Thunderstorm,
TSRA Thunderstorm with Rain










Past 24 hours DWR 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
Patna/ 30-03-17	290300- 300300	Single Cell. Maximum Reflectivity : 39 dBz, Echo Top : 04.5 KM	Range : 135 KM from DWR Patna in North-East Movement-South -West	NIL	NIL	MADHUBANI
	30/0150- 30/0250-	DWR U/S	-	-	-	-
DWR Paradeep/ 30-03-17	0410-2200	Isolated cells with average height of 4 km having maximum reflectivity of 20 dBZ with very small areas showing reflectivity values in the range of 30- 40 dBZ and average heights of 7 km observed during late evening to mid night over the sea.	Mainly concentrated in the sea areas to the south of the RADAR (150-240 degrees) at a distance of 80- 200kms from the RADAR. Position is almost stationary. Increased dBZ values observed between 1230 to 1800 UTC.	NIL	NIL	NIL
DWR Agartala/ 30-03-17	290300 - 280500	Multiple Cells with Maximum Height 12 km and maximum reflectivity 39.5 dBZ	NW (200 KM) at 1820 UTC of 28.03.17 from DWR Agartala moving SE-wards at around 20	Cell dissipated at 0500 UTC of 29.03.17 over Tripura	Thunderstorm with Light Rain	West Tripura District
	290530 – 292130	Multiple Cells with Maximum Height of 15 km and maximum reflectivity 54 dBZ	NW (150 KM) from DWR Agartala moving ESE-wards at around 15 kmph	Cell dissipated at 2130 UTC of 29.03.17 over Mizoram	Thunderstorm with Moderate rain	West, North, Unokoti, Dhalai, Khowai Districts
	291820 – 300300	Multiple Cells with Maximum Height 15 Km and maximum reflectivity 50 dBZ	NW (200 KM) at from DWR Agartala moving ESE-wards at around 25 kmph	At 0300 UTC of 30.03.17, cells persist over Eastern part of Tripura with maximum reflectivity of 45 dBZ	Thunderstorm with Light Rain	North, Unokoti Districts

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
Lucknow	30-03-17	290300-300300	Nil	--	--	--	--
Jaipur	30-03-17	290300-300300	Nil	--	--	--	--
Patiala	30-03-17	290302-300252	Nil	--	--	--	--
DWR Nagpur	29-03-17	0302-0852	Nil	Nil	No Echoes	Nil	Nil
		0852-1658	-----	-----	Radar stopped for AC work	-----	-----
		1742	Very small	125km NW from Nagpur radar	25 dBZ	Nil	Nil
		1902	Very small	125km SE from Nagpur radar	30 dBZ	Nil	Nil
		1912-2352	Nil	Nil	No Echoes	Nil	Nil
	30-03-17	0002-0222	Nil	Nil	No Echoes	Nil	Nil
		0222-0302	-----	-----	Radar stopped for cleaning of slipping	-----	-----

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
Mohanbari	29/03/17	0452-0822 UTC	Cell type- Isolated Avg. ht.- 4.7 Km MAX_Z:- 44.5 dbZ	Distance- 40 Km Direction- E & NE Movement- NEly	Cells are moved away towards NE direction at a speed of 20km/hr (approx.)from the Station	NIL	N/A
Mohanbari	29/03/17	0852-0952 UTC	Cell type- Isolated Avg. ht.- 8.2 Km MAX_Z:- 40.5 dbZ	Distance- 212 Km Direction- SW Movement- NEly	Cells started forming at 0552 UTC with MAX_Z 40.5 & reduces to MAX_Z 35.5 at 0952 UTC, moved NEly at a speed of 24km/hr (approx.)	NIL	N/A
Mohanbari	30/03/17	0432-0602 UTC	Cell type- Isolated Avg. ht.- 4.7 Km MAX_Z:- 31.5 dbZ	Distance- 120 Km Direction- SW Movement- Almost stationary	Weak cells	N/A	N/A
Mohanbari	30/03/17	0432-0602 UTC	Cell type- Isolated Avg. ht.- 4.0 Km MAX_Z:- 33.0 dbZ	Distance- 100 Km Direction- NE Movement- Ely	Weak cells	N/A	N/A

∞	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

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