



**India Meteorological Department**  
**FDP STORM Bulletin No. 41 (15-04-2017)**

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

**SYNOPTIC FEATURES:**

The depression over southeast Bay of Bengal moved north-northeastwards with a speed of 20 kmph during the past 3 hours and lay centered at 0830 hrs IST of today, the 15th April, 2017 over southeast & adjoining east-central Bay of Bengal near Lat. 12.5°N and Long. 88.3°E, about 500 km west-southwest of Maya Bandar (Andaman & Nicobar Islands) and 950 km south southwest of Kyaukpyu (Myanmar). The system is most likely to intensify further into a deep depression during next 24 hours. It is most likely to move north-northeastwards and cross Myanmar coast between Sittwe and Sandway (Myanmar) by forenoon of 17th April.

The trough from Madhya Maharashtra to south Tamilnadu across Interior Karnataka now runs from Marathwada to Lakshadweep area across coastal Karnataka and extends upto 0.9 km above mean sea level.

The upper air cyclonic circulation over northwest Rajasthan & neighbourhood now lies over northeast Rajasthan & neighbourhood and extends upto 1.5 km above mean sea level.

A trough runs from the above system to Marathwada across west Madhya Pradesh & west Vidarbha and extends upto 0.9 km above mean sea level.

Another trough runs from above system to northeast Jharkhand across north Madhya Pradesh and extends upto 0.9 km above mean sea level.

An upper air cyclonic circulation lies over east Bihar and neighbourhood at 1.5 km above mean sea level.

The trough in mid-tropospheric westerlies along longitude 88.0°E and north of latitude 22.0°N has become less marked.

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

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

**VORTEX:**

Vortex over south Bay has organized further and now lay centre within a half degree of lat 12.2N/88.3E. Intensity T 1.5 (minimum CTT minus 93 deg c). Associated broken low/medium clouds with embedded intense to very intense convection seen over south adjoining east-central Bay between Lat 9.0N to 17.0N long 86.5E to 95.0E

**Cloud Description:**

Scattered low/medium clouds with embedded moderate to intense convection were seen over extreme northwest Bihar, Sikkim, Arunachal Pradesh adjoining Assam. Scattered low/medium clouds with embedded isolated weak to moderate convection were seen over Sub-Himalayan West Bengal. Scattered low/medium clouds lie over J & K, Central Punjab, northwest Rajasthan, south Tamilnadu and Bay Islands.

**Arabian Sea:**

No significant clouds over the region.

**Bay of Bengal & Andaman Sea:**

Broken low/medium clouds with embedded moderate to intense convection were seen over rest Bay and Andaman Sea.

**Past Weather:****Convection:**

Moderate convection was observed over east Himachal Pradesh..

**OLR:-** Up to  $270 \text{ w m}^{-2}$  was over J&K, HP , Uttarakhand Kerala, Tamilnadu, S Andhra Pradesh, S Karnataka ,Sikkim and Arunachal Pradesh.

Up to  $300 \text{ w m}^{-2}$  was over E Bihar and Sub Himalayan West Bengal .

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

**Jet Stream:**

No Jet stream and trough observed over India.

**Dynamic Features:**

Positive shear tendency and wind shear observed over India.

A positive Vorticity field is seen over Karnataka, Marathawada, W Vidarbha, S Bihar and Odisha.

Positive Low Level Convergence observed over North Interior Karnataka, Telengana, N Uttar Pradesh, NE States, Gangetic West Bengal and coastal Odisha. Negative low level convergence observed over rest parts of India.

**Precipitation:**

**IMR:** Rainfall upto 30mm was observed over extreme NE J&K, NE Uttarakhand. Rainfall upto 10mm was observed over rest NE J&K, E Himachal Pradesh , N Uttarakhand, Sikkim, Arunachal Pradesh, Tamil Nadu , S Andhra Pradesh ,S Kerala and S coastal Karnataka .

**HEM:** Rainfall upto 70 mm was observed over N Uttarakhand. Rainfall upto 7 mm was observed over Arunachal Pradesh, E Bihar, S Andhra Pradesh, Tamil Nadu, S Kerala, S coastal Karnataka.

**RADAR and RAPID observation:**

Isolated light echo (dBZ around 40 and height 7km) was seen in DWR Patna at 1251hrs IST. No other significant echo was seen in DWR Composite at 1240hrs IST.

RAPID RGB Satellite imagery of 1200hrs IST shows convective clouds over north Bihar, Sub-Himalayan west Bengal, Sikkim, Arunachal Pradesh, Assam and Andaman & Nicobar Island.

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

**Not Received**

## 2. NWP MODEL GUIDANCE:

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

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

12UTC Charts all of the days show the development of Heat Low over Rajasthan and adjoining Pakistan and its extension over IG plains is prominent. Over Bay of Bengal the intensification of the low pressure system and its movement towards Myanmar coast from Day 0 to 18UTC on Day-2 is evident.

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

Depression over BoB getting intensified as day progresses moving NE wards towards Myanmar.

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

Weaker core winds at 12 UTC on all days over India

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

At 12UTC on Day-0 to Day-2: High values along the Western Ghats in Karnataka, Maharashtra and Kerala

Day 3-4: Over coast of Maharashtra

Day 0-4: Parts of Odisha.

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

At 12UTC : Scattered isolated values in Day-1 to Day-2 enhanced magnitude over some isolated regions of Bihar, Jharkhand, WB.

#### **High Cyclonic vorticity over BoB due to Depression**

At 00UTC on all days: Strong structure over land extending N-S from western part of India

#### **High Cyclonic vorticity over BoB due to Depression**

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

At 12UTC: Day 0-3: Along west coast, some parts of Bihar, WB

Day-3 and Day-4 High magnitude over UP, Bihar, Jharkhand, WB, Odisha, along west & east coast of India and southern parts of NE states.

At 00UTC on Day-3-5: Large belt of high magnitude extending SW to NE from NI Karnataka-Telangana region to Chhattisgarh, Odisha region.

#### **Additionally moderate values of index are prominent over large parts of BoB associated with Depression**

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

At 12UTC: Day 0-1: Along west coast, some parts of Bihar, WB

Day-3 and Day-4 High magnitude over UP, Bihar, Jharkhand, WB, Odisha, along west & east coast of India and southern parts of NE states.

#### **Additionally moderate values of index are prominent over large parts of BoB associated with Depression**

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

At 12UTC : Day0: WB and coastal Odisha, AP, Kerala, Karnataka, some parts of J&K

Day1 High values over coast of Karnataka, Kerala and parts of Tamilnadu, coastal AP and Odisha, and some parts of east UP Bihar and WB, Odisha.

Day-3&4: Increased values over coast of Maharashtra. Moderate values widespread over eastern India covering parts of MP UP, parts of Bihar, WB.

At 00UTC on Day-2,3 and 4: Large belt of high magnitude extending SW to NE from NI Karnataka-Telangana region to Chhattisgarh Odisha region

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

Day1: >4cm/day over Meghalaya and adjoining Assam

Day2: 2 cm/day Over WB and adjoining Bangladesh.

**Day 1: >32 cm/day Associated with Depression over Andaman.**

**Day 2& 3: >16 cm/day Associated with system close to Myanmar coast.**

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

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

00 UTC analysis shows a low level CYCIR along with north-south trough over south of Marathwada and adjoining north Karnataka region and this CYCIR will persist for the next 2 days.

Analysis also shows a north-south oriented low level trough of low starting from Jharkhand and adjoining Gangetic West Bengal (GWB) regions to central India and this trough of low will persist for the next 2 days.

MSLP analysis shows a low pressure area over central BoB and will move towards Arakan coast during the next 2 days.

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

No presence of jet core over the Indian region for the next 5 days.

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

Analysis shows low level positive vorticity (>12 x 10<sup>-5</sup>/s) mainly over the foothills of Himalaya, along the west coast of India, SHWB, Jharkhand, GWB and isolated pockets of NE states.

Forecast shows vorticity core zones mainly along the foothills of Himalaya, west coast of India, and isolated pockets of GWB and NE states, Marathwada, interior parts of Karnataka and few pockets along the east coast bordering Odisha and SHWB along with few regions of the north eastern states for the next 3 days.

#### **4. Spatial distribution of T-Storm Initiation Index, Lifted Index, Total Total Index, CAPE, CINE and Sweat Index (High potential for thunderstorm):**

**T-Storm Initiation Index (> 4):** Significant threshold values are noticed over Jharkhand, GWB, along the east of India and few pockets in AP and along the west coast of India. Forecast shows significantly high threshold values over west coast of India, GWB and eastern coast for the next 3 days.

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

**Sweat Index (> 400):** 00UTC shows significant values over major parts along with the east coast extending up to coastal TN and also over west coast of India and few isolated pockets in the NE states. The significant zones are confined along east coast of India over GWB, Odisha, Bangladesh and adjoining regions and high value of SI observed over GWB and south AP coastal regions and NE region for next 5 days and also over few pockets in the south west region.

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

**CAPE (> 1000):** Mostly along east coast of India over GWB, Odisha and adjoining AP regions along with parts in south peninsular region and coastal Kerala and Karnataka during the next 5 days.

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

**5. Rainfall and thunderstorm activity:**

10-40 mm rainfall is forecasted tomorrow over most parts of the NE states and also some parts of Kerala regions. Isolated light to moderate rainfall activity over pockets of NE states and Kerala will continue for the next 2-3 days.

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

**Summary and Conclusions:**

**Day 1 & Day 2:**

In association with the depression over southeast Bay of Bengal which is moving north-northeast-wards towards Myanmar, very heavy rainfall is expected over Andaman and Nicobar Islands on day 1, which is likely to decrease on day 2.

In association with the trough from Marathawada to Lakshadweep, thunderstorms are likely over Kerala and South Karnataka on day 1. This thunderstorm activity is likely to decrease on day 2.

In association with the upper air cyclonic circulation over northeast Rajasthan & neighbourhood dust raising winds are expected over North Rajasthan on day 1.

In association with the upper air cyclonic circulation over east Bihar and neighbourhood, thunderstorm activity, sometimes accompanied by hail or squall is likely over entire North east India on day 1. This is likely to decrease on day 2

**24 hour Advisory for IOP:**

Andaman and Nicobar Islands  
Arunachal Pradesh and adjoining east Assam  
Rest of Assam and Meghalaya  
East Bihar, Sub Himalayan West Bengal, North Gangetic West Bengal  
Kerala and South Karnataka

**48 hour Advisory for IOP:**

Andaman and Nicobar Islands  
Assam and 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](http://nwp.imd.gov.in/diagpro_new.php))

ForSynopticplotteddataandcharts

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

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

ForRAPIDtool:

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

LowLevelWinds

[http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/LLW/MAR\\_2017/?C=M;O=D](http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/LLW/MAR_2017/?C=M;O=D)

Upperlevelwinds

[http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/HLW/MAR\\_2017/?C=M;O=D](http://satellite.imd.gov.in/archive/INSAT-3D-IMAGER/3D-PRODUCTS/AMV/HLW/MAR_2017/?C=M;O=D)

Past24hourHEMandIMRrainfall(upto03UTCoftoday)

IMR:[http://satellite.imd.gov.in/img/3Ddaily\\_imr.jpg](http://satellite.imd.gov.in/img/3Ddaily_imr.jpg)

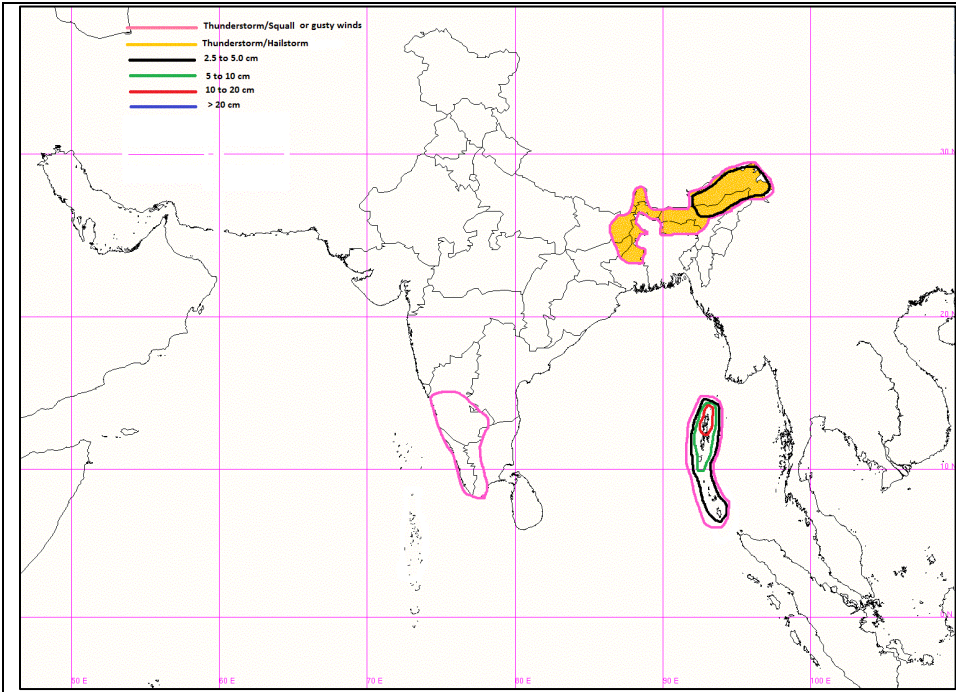
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ForRadarimagesofthepast24hoursincludingmosaicofimages:

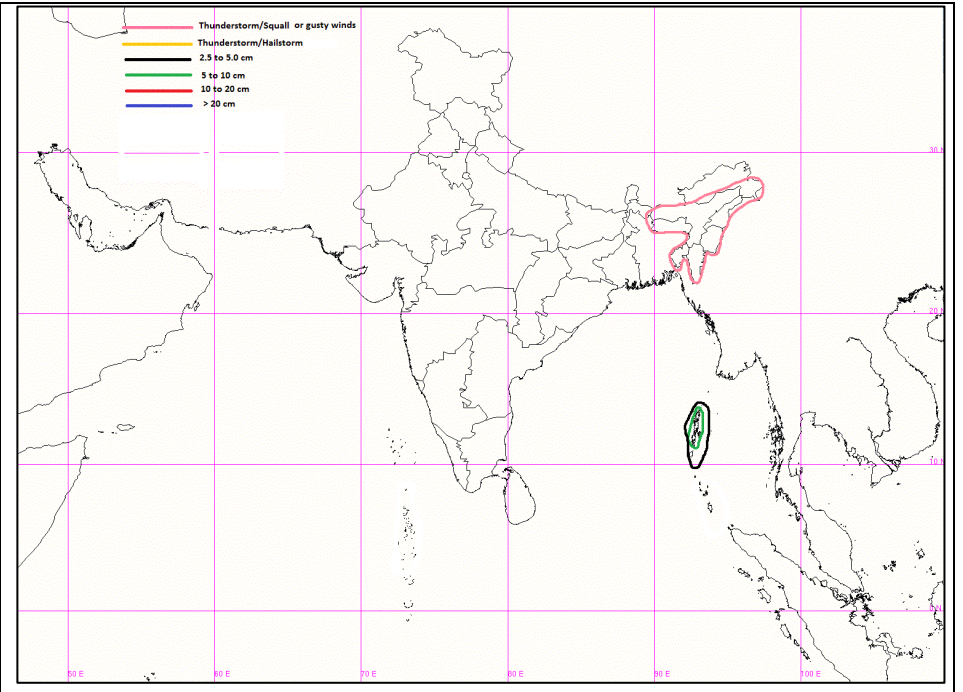
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Satellite sounder based T-Phi gram

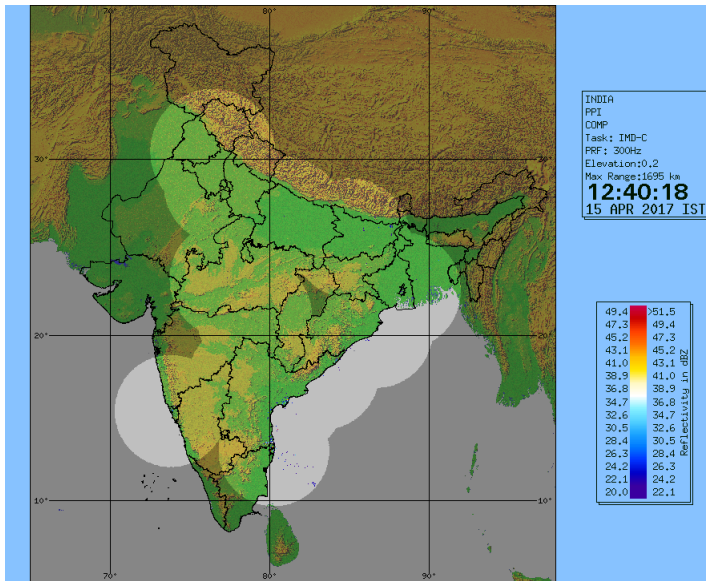
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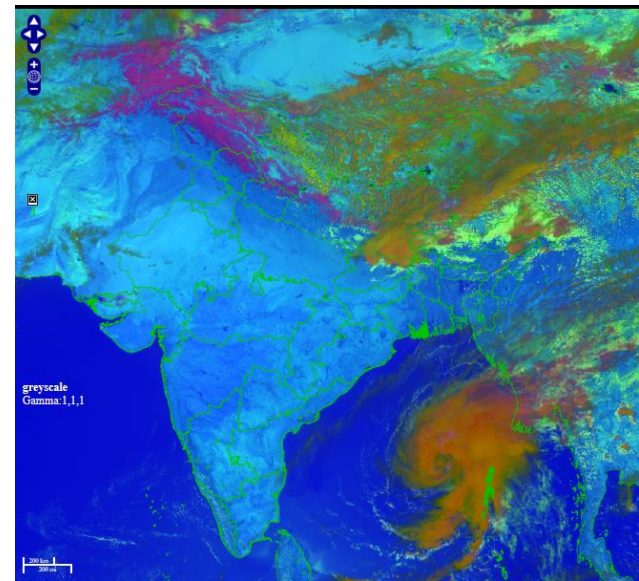
**IOP Advisory for 24 hours**



**IOP Advisory for 48 hours**



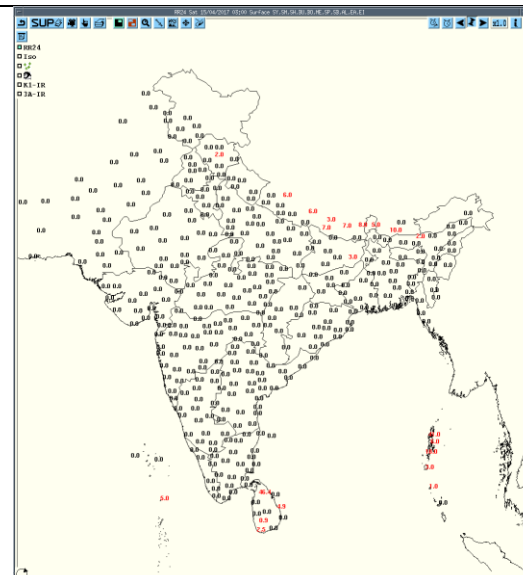
**DWR Composite at 1240 hrs IST of today**



**RAPID RGB Image of INSAT 3D at 1200 hrs IST of today**

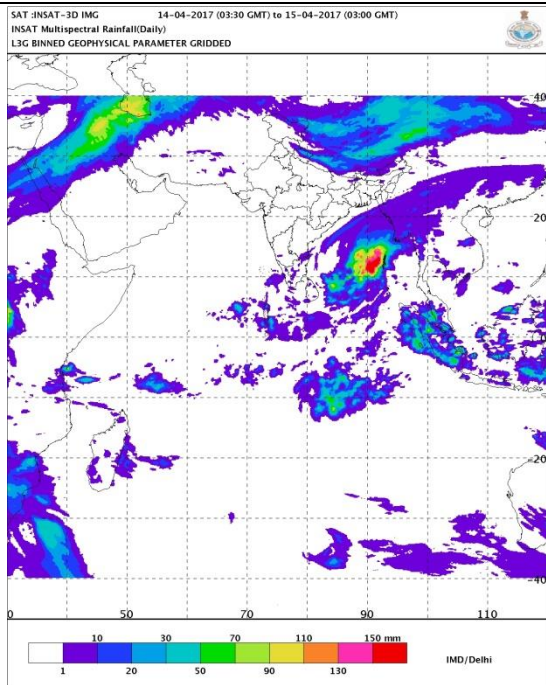


Not Received

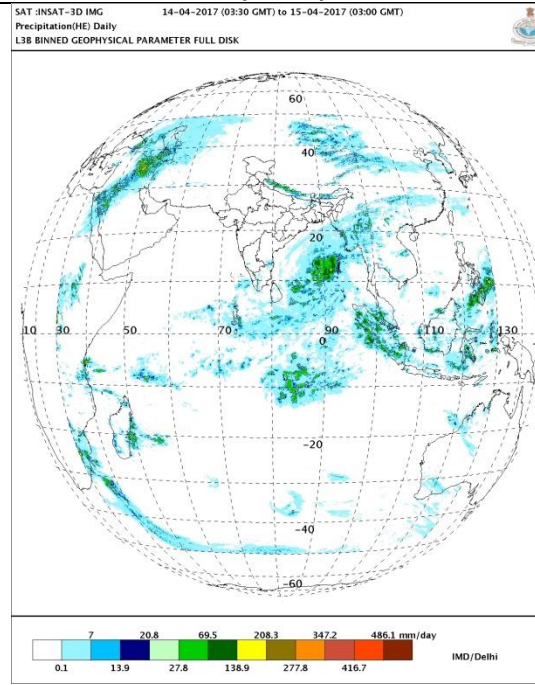


Forecast Dust Concentration for 00UTC of 16<sup>th</sup> April

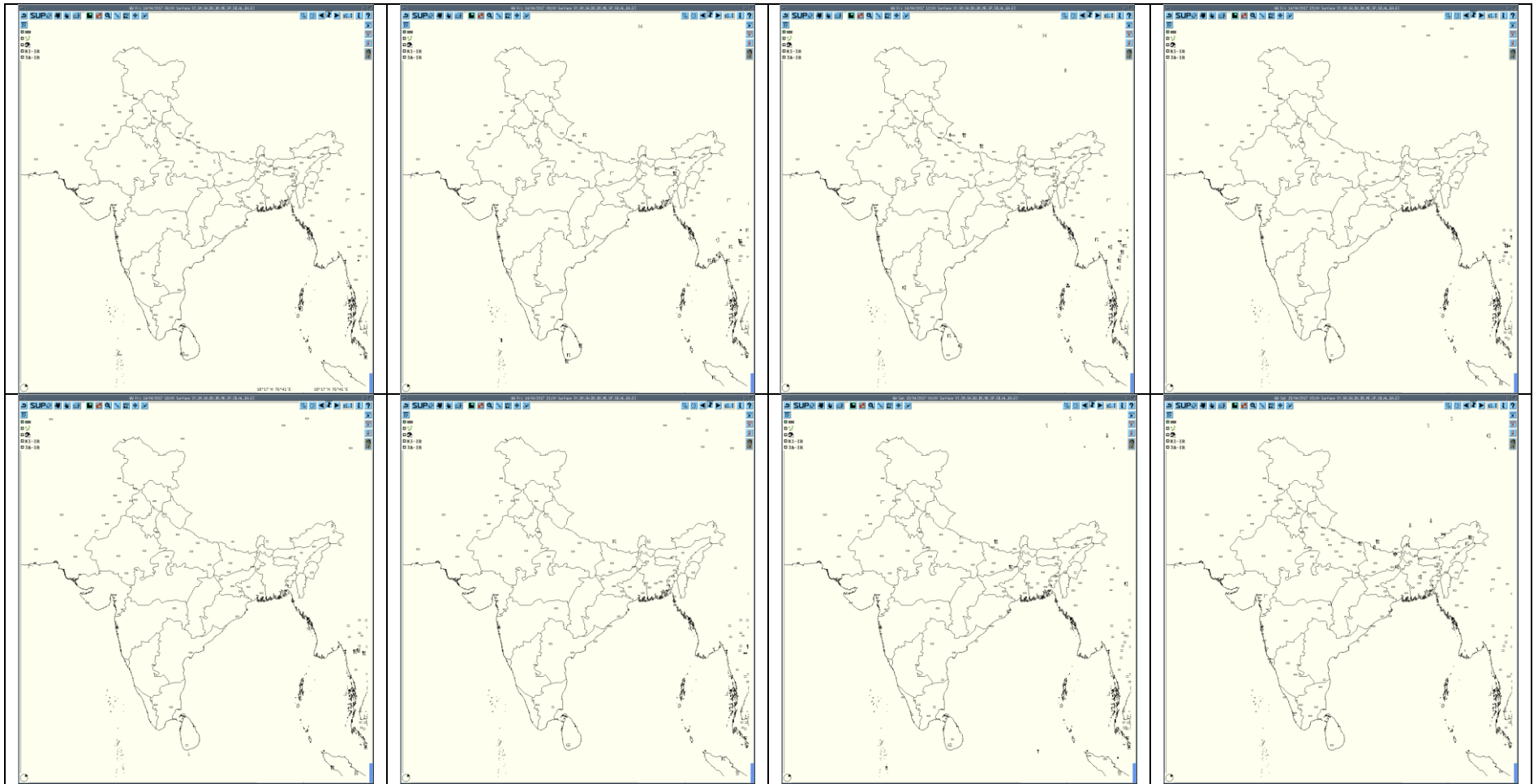
Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today



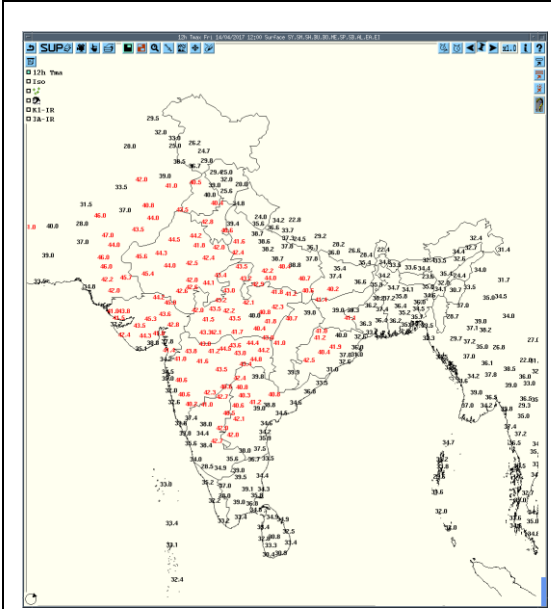
IMR Rainfall



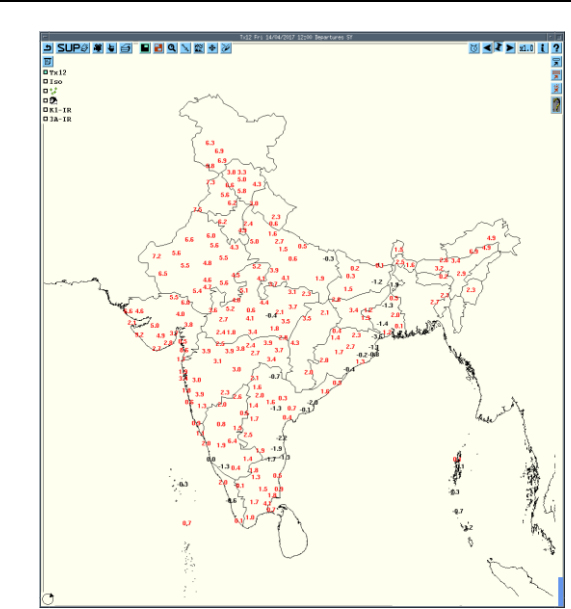
HEM Rainfall



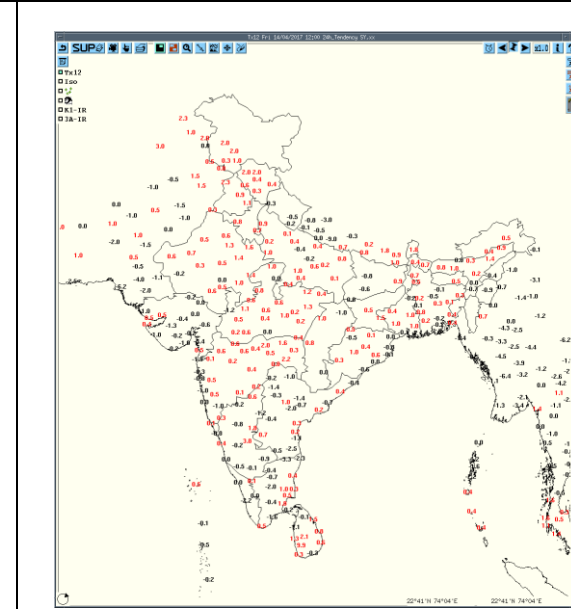
3hourly Past weather at 06, 09, 12, 15, 18, 21UTC of yesterday and 00 & 03 hrs UTC of today



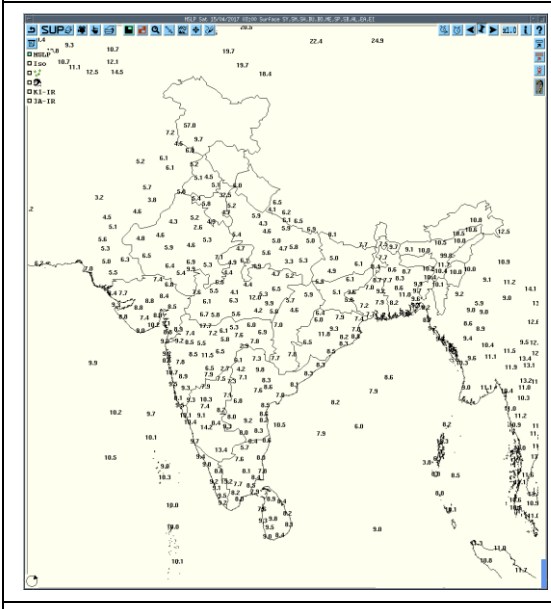
Tmax



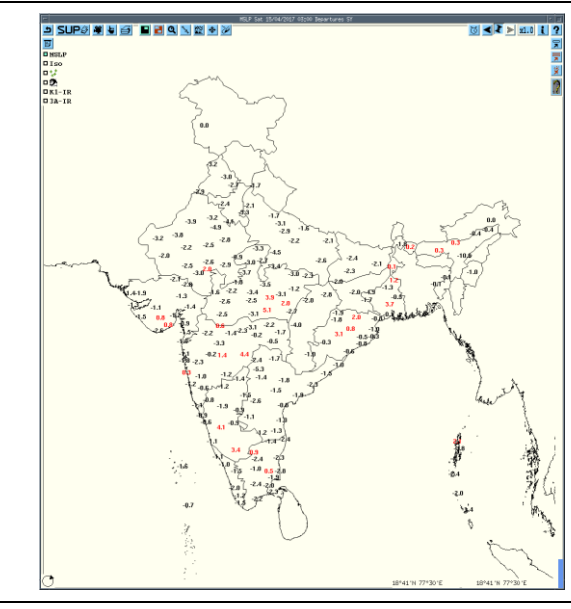
Departure Tmax



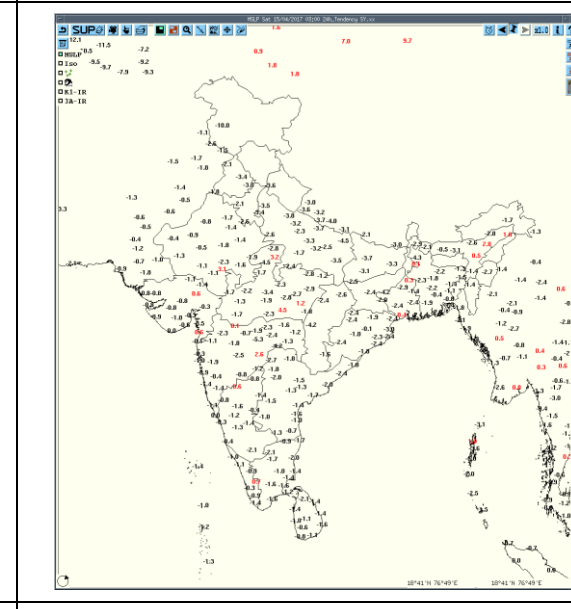
Tendency Tmax



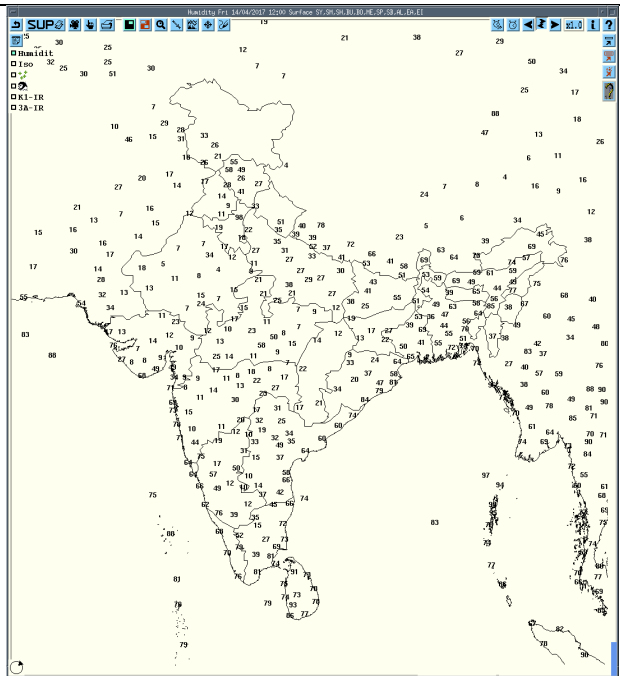
MSLP



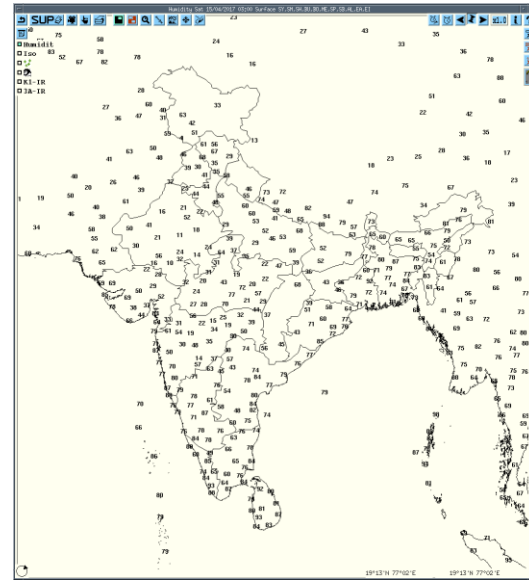
Departure MSLP



Tendency MSLP



**RH at 12UTC yesterday**



**RH at 03UTC today**

**Realized weather past 24 hours (Based on SYNERGIE Products)**

<b>Date</b>	<b>Time of Reporting</b>	<b>Name of Station Reporting</b>	<b>Region</b>	<b>STATE</b>	<b>Weather Event</b>
14-04-17	0600 UTC	Nil	Nil	Nil	Nil
14-04-17	0900 UTC	Shillong	Northeast India	Meghalaya	Thunderstorm
14-04-17	1200 UTC	Shimoga	South India	Karnataka	Thunderstorm
14-04-17	1500 UTC	Nil	Nil	Nil	Nil
14-04-17	1800 UTC	Nil	Nil	Nil	Nil
14-04-17	2100 UTC	Nil	Nil	Nil	Nil
15-04-17	0000 UTC	Bhagalpur	East India	Bihar	Thunderstorm
15-04-17	0300 UTC	North Lakhimpur	Northeast India	Assam	Thunderstorm
		Purnea	East India	Bihar	Thunderstorm
		Tadong	East India	Sikkim	Thunderstorm
		Passighat	Northeast India	Arunachal Pradesh	Thunderstorm
		Dibrugarh	Northeast India	Assam	Thunderstorm

**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
Vishakhapatnam	15-04-17	140300-140600	Multiple cells with average height of 5km with maximum reflectivity 38 dBZ	SW(180KM)	Cells start forming and not matured.	-	■
		140600-140900	NIL	NIL	-	-	■
		140900-141200	Multiple cells with average height of 8km with maximum reflectivity 47dBZ	NE(220KM)	-	-	■
		141200-141500	Multiple cells NEly and SWly with average height of 3km with maximum reflectivity 45dBZ	NE sector and SW sector	Cells are forming and dissipating quickly-	-	■
		141500-141800	Multiple cells NEly and SWly with average height of 3km with maximum reflectivity 45dBZ	NE sector and SW sector	Cells are forming and dissipating quickly-	-	■
		141800-150000	Multiple cells NEly and SWly with average height of 3km with maximum reflectivity 45dBZ	NE sector and SW sector	Cells are forming and dissipating quickly-	-	■
		150000-150300	Multiple cells of max intensity 42 dbz NE ly and SW ly 120kms .	Cells are not formed effectively and not well organized.	0000 UTC-0300 UTC	Multiple cells of max intensity 42 dbz NE ly and SW ly 120kms .	Cells are not formed effectively and not well organized.

Nagpur		141432-142352	<b>Group of very small patches</b>	Distributed over North & East region within 50 km range, moving W'ly & covering 30to 70 km range in West	< 7 dBZ, ht of cloud is approx 1.4 km		
		150212-150302	<b>Single</b>	100 km SE, moving SE'ly, becomes group of small patches, <b>still moving SE'ly</b>	< 10 dBZ		
Patna	15-04-17	140300-150300	1.single cell having Maximum reflectivity 52dBZ with height of 12 km at 05:27 hrs IST on15-04-2017	1.Formed at NE Direction from DWR Patna at the distance of 168 KM. Movement-SEly	NIL	Thunderstorm/Hail	Khagaria,M adhepura,M unger,Bhag alpur,Purne a and Banka
			2.Multiple cell having maximum reflectivity 50.5dBZ with height of 13 km at 08:15 hrs IST on 15-04-2017	2.Formed at NE Direction from DWR Patna at the distance of 167 KM. Movement-SEly	NIL	Thunderstorm/Hail	East champaran, west champaran, Gopalganj,S heohar,Sita marhi,Madh ubani
Srinagar	15-04-17	Nil	Nil	Nil	Nil	Nil	Nil
Patiala	15-04-17	140302-150252	Isolated cells Height8-9 km 46.5dbz	ENE Direction, movement SE wards			Gangotri, Uttarkashi
Lucknow	15-04-17	140300-150230	NIL	NIL	NIL	NIL	NIL
		150230- 150340	Isolated single cell Maximum Reflectivity 40dBZ	270Kms from Lucknow and moving NWly	--	RATS/DS	Mahrajganj
Agartala	15-04-17	140550–141050	Multiple Cells with Maximum Height <b>15 km</b> and maximum reflectivity <b>47 dBZ</b> (at 0900 UTC over Eastern Meghalaya)	Formed NNE (190 KM) from DWR Agartala, at 0550 UTC, almost stationary during development stage and later on moved NE-wards at around 20 kmph	Cells dissipated at 1050 UTC of 14.04.17 over Eastern Meghalaya and adjoining Assam	N/A	N/A
Paradeep		141100-141400	Isolated cell with maximum reflectivity 25	Position: Lat.: -19.7deg.N	NIL	NIL	NIL

			Dbz & average height of 05.0 km and maximum height reached up to 08.0km. in later stage at 1730Hrs IST. Thereafter cell is shown transformed into multi-weak cell in dissipation.	Long:-86.1deg.E Range:-70km-200km. AZ:-200deg.-230deg. Movement-SSWly.			
Kolkata	15-04-17	140311-150300	NIL	NIL	NIL	NIL	NIL
Hyderabad	15-04-17	140300-150300	NIL	NIL	NIL	NIL	NIL
Machilipatnam	15-04-17	140300-150300	NIL	NIL	NIL	NIL	NIL



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

		
+ thunderstorm	+ heavy thunderstorm	sandstorm or dust storm
		
squall	hail shower	tropical storm
		
+ tornado	+ lightning	+ hurricane