



India Meteorological Department
FDP STORM Bulletin No.103 (16-06-2017)

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

The southwest monsoon has further advanced into some more parts of Madhya Maharashtra, remaining parts of Marathwada, some parts of Vidarbha, some more parts of Chhattisgarh, most parts of Odisha, remaining parts of West Bengal and some parts of Jharkhand and Bihar. The Northern Limit of Monsoon (NLM) passes through Lat 20.5°N/ Long 60.0°E, Lat 20.5°N/Long. 70.0°E, Valsad, Nasik, Buldana, Yeotmal, Kanker, Jharsuguda, Jamshedpur, Bhagalpur and Lat 27.0°N/Long 86.0°E.

Favorable Conditions are developing for further advance of southwest monsoon into some more parts of Madhya Maharashtra, Vidarbha, Chhattisgarh remaining parts of Odisha, Jharkhand and Bihar during next 3-4 days.

The low pressure area over northwest Bay of Bengal & neighbourhood now lies over southwest Bangladesh & neighbourhood and associated upper air cyclonic circulation extends upto 4.5 km above mean sea level.

The trough at mean sea level from Punjab to northwest Bay of Bengal now runs from northwest Rajasthan to centre of low pressure area across south Uttar Pradesh & Jharkhand and extends upto 0.9 km above mean sea level with an embedded cyclonic circulation over central parts of south Uttar Pradesh extends upto 1.5 km above mean sea level.

The trough from eastern parts of Bihar to northwest Bay of Bengal has merged with the low pressure area.

The east west shear zone now runs roughly along latitude 18.0°N between 3.1 & 3.6 km above mean sea level also.

The off shore trough off Karnataka Kerala coast, now runs from south Maharashtra coast to Kerala coast.

An upper air cyclonic circulation lies over Haryana & neighbourhood at 1.5 km above mean sea level.

The upper air cyclonic circulation over Southwest Bihar & neighbourhood has become less marked

SATELLITE OBSERVATIONS during past 24hrs and current observation:

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

WESTERN DISTURBANCE (WD):

Scattered multi-layered clouds were seen over J & K, Himachal Pradesh, East Punjab, Uttarakhand, Haryana, Delhi, West Uttar Pradesh, and Tibet adjoining China in association with WD over the area.

Cloud Description:

Broken low/medium clouds with embedded moderate to intense convection were seen over Karnataka, Telangana, Andhra Pradesh, North Kerala and exterior Northeast Tamilnadu.

Scattered low/medium clouds with embedded moderate to intense convection were seen over exterior Northeast Assam, Mizoram and Tripura.

Scattered low/medium clouds with embedded isolated weak to moderate convection were seen over rest Assam, Meghalaya, Nagaland, Manipur, Sub Himalayan West Bengal, North Bihar, South Chhattisgarh, rest Odisha, South Vidarbha, Marathwada, South Konkan & Goa, Northwest Madhya Pradesh, rest Kerala and rest Tamilnadu.

Scattered low/medium clouds were seen over rest Uttar Pradesh, South Bihar, North Chhattisgarh, Jharkhand, Northeast Odisha, Southwest Gangetic West Bengal and Bay Islands.

Arabian Sea: Scattered low/medium clouds with embedded isolated weak to moderate convection were seen over EC & SE Arabian Sea.

Bay of Bengal & Andaman Sea:

Broken low/medium clouds with embedded intense to very intense convection were seen over WC & adjoining EC Bay. Scattered low/medium clouds with embedded moderate to intense convection were seen over Arakan Coast.

Past Weather:

Convection:-

Moderate to Intense convection was observed over J&K Himachal Pradesh Punjab Haryana Delhi North-West Rajasthan North-East Uttar Pradesh Bihar Jharkhand West Bengal North East States Chhattisgarh Madhya Pradesh Maharashtra Telangana Andhra Pradesh Karnataka Kerala Tamilnadu.

OLR:-

Upto **100** wm^{-2} was observed over North East Andhra Pradesh.

Upto **200** wm^{-2} was observed over South Chhattisgarh Maharashtra Jharkhand Odisha North Interior Karnataka Telangana Rest Andhra Pradesh Kerala Tamilnadu.

Upto **230** wm^{-2} was observed over J&K Himachal Pradesh North Uttarakhand Rest Chhattisgarh Bihar Rest Jharkhand Rest Karnataka.

Upto **250** wm^{-2} was observed over West Bengal North East States.

Westerly Trough & Jet-Stream: No Westerly trough and Jet Stream observed over India.

Dynamic Features:

Medium to High wind shear is observed over North & South India and Low wind shear is observed over Central India.

Negative shear tendency is observed over Coastal Maharashtra Goa Coastal Karnataka Kerala and Positive shear tendency is observed over rest India.

A Positive Vorticity field is observed over Chhattisgarh East Madhya Pradesh and Rayalaseema .Negative low level convergence is observed over East Gujarat West Bengal and Positive low level convergence observed over rest parts of India,

Precipitation:**IMR:**

Rainfall from **150** mm was observed over North East Odisha Coastal Andhra Pradesh.

Rainfall from **110** mm was observed over south West Odisha.

Rainfall from **90** mm was observed over South Chhattisgarh Vidarbha South Jharkhand.

Rainfall from **70** mm was observed over East Jharkhand Rest Odisha West Gangetic West Bengal North East Andhra Pradesh. Rainfall from **50** mm was observed over Rayalaseema Rest Andhra Pradesh North Interior Karnataka Marathwada.

Rainfall Up to **20** mm was observed over Kerala Tamilnadu.

Rainfall Up to **10** mm was observed over J&K Haryana Delhi South Madhya Pradesh Rest Maharashtra Rest Chhattisgarh Bihar Rest West Bengal North East States Rest Karnataka Rest Tamilnadu.

HEM:

Rainfall Up to **70** mm was observed over Odisha South Chhattisgarh Vidarbha North Coastal Andhra Pradesh.

Rainfall Up to **14** mm was observed over Marathwada Kerala.

RADAR and RAPID Observation:

Multiple echoes was seen in DWR Agartala (with dBZ >40 and height around 10km) at 0832hrs UTC.

RAPID RGB Satellite imagery at 1200hrs IST indicated significant convective clouds over Assam, East Meghalaya, Mizoram, Central Uttar Pradesh, Southwest Bihar, South Maharashtra, North coastal Andhra Pradesh and South Chhattisgarh.

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

Higher Dust concentration was observed over north Africa. Dust concentration is expected to remain high over north India for next five days.

High PM10 concentration was observed over western and northern part of the country and Pakistan; it is expected to decrease over north India and IGP in the next five days.

2. NWP MODEL GUIDANCE:

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

1. Weather Systems:

12UTC Charts of Day 0-4 show heat low over NW India and adjoining Pakistan with MSLP values lower than 992hPa. In day 2-4 the heat low region extends from Rajasthan to Bihar across Haryana, Uttar Pradesh.

12UTC charts of Day 0-2: show a zone of wind discontinuity at 925 hPa; SW-NE extending from Madhya Pradesh to Jharkhand/Bihar

12 UTC charts of Day 0-4: Western Disturbance as a trough is seen over North and NW India in all the days .

00UTC charts of Day 1: Offshore trough over Maharashtra, Karnataka and Kerala coast. Trough moves eastward and is seen off Tamilnadu, AP and Odisha coast in Day 3-5.

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:

Day0: NE NMMT,

Day1: Assam Meghalaya,

Day2: Arunachal Pradesh,

Day3: Assam Meghalaya, East UP,

Day4: Nil

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

(Day/Index: Subdivisions with Lower Level Vortex > 15 x 10⁻⁵ /s):

Day0: Gangetic WB, TN Puducherry,

Day1: Assam Meghalaya, TN Puducherry, Kerala,

Day2: Arunachal Pradesh, Assam Meghalaya, Uttarakhand, Himachal Pradesh, TN Puducherry, Kerala,

Day3: Arunachal Pradesh, Assam Meghalaya, Uttarakhand, TN Puducherry, Kerala,

Day4: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Bihar, TN Puducherry, Kerala

5. Showalter Index: -3 to -4[Very unstable]: (Day/Index: Subdivisions with Showalter Index < -4):

Day0: Arunachal Pradesh, Sub Himalayan WB, Gangetic WB, Jharkhand, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan, East Rajasthan, Odisha, West MP, East MP, Gujarat region, Saurashtra Kutch, Konkan Goa, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh,

Day1: Arunachal Pradesh, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan, East Rajasthan, Odisha, West MP, East MP, Gujarat region, Saurashtra Kutch, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Telangana,

Day2: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan, Odisha, West MP, Marathwada, Vidarbha, Chhattisgarh, Telangana,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan, East Rajasthan, Odisha, West MP, East MP, Gujarat region, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, NI Karnataka,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan, East Rajasthan, Odisha, West MP, East MP, Gujarat region, Saurashtra Kutch, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana

6. K-Index :-> 35[Very Unstable thunderstorm likely]: (Day/Index: Subdivisions with K Index > 40):

Day0: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan, East Rajasthan, Odisha, West MP, East MP, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, TN Puducherry,

Day1: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan, East Rajasthan, West MP, East MP, Gujarat region, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Telangana,

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan, East Rajasthan, Odisha, West MP, East MP, Gujarat region, Saurashtra Kutch, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, NI Karnataka,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, East Rajasthan, Odisha, West MP, East MP, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalaseema, TN Puducherry, NI Karnataka, SI Karnataka,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha, West MP, East MP, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, TN Puducherry, NI Karnataka, SI Karnataka

7. Spatial distribution of TTI (TTI >50 [Scattered Thunderstorms few severe): (Day/Index: Subdivision with Total Totals Index > 52):

Day0: Arunachal Pradesh, Sub Himalayan WB, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Himachal Pradesh, Jammu Kashmir, West Rajasthan, East Rajasthan, West MP, Gujarat region, Saurashtra Kutch, Madhya Maharashtra, Vidarbha,

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

Day2: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan,

Day3: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan, Odisha, Chhattisgarh,

Day4: Arunachal Pradesh, Sub Himalayan WB, Gangetic WB, Jharkhand, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan, East Rajasthan, Odisha, West MP

8. Rainfall and thunder storm activity: (Day/Index: Subdivisions with Precipitation > 2 cm):

Day1: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Gangetic WB, Haryana, Chandigarh, Delhi, Himachal Pradesh, West Rajasthan, East Rajasthan, Konkan Goa, Madhya Maharashtra, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalaseema, TN Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Himachal Pradesh, Jammu Kashmir, East Rajasthan, Konkan Goa, Madhya Maharashtra, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Himachal Pradesh, Jammu Kashmir, Konkan Goa, Madhya Maharashtra, Coastal Karnataka, SI Karnataka, Kerala,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha, Konkan Goa, Madhya Maharashtra, Chhattisgarh, Coastal AP, Telangana, Coastal Karnataka, SI Karnataka, Kerala,

Day5: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Bihar, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha, Konkan Goa, Madhya Maharashtra, Chhattisgarh, Coastal AP, Telangana, Coastal Karnataka, Kerala

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

1. Weather Systems:

The analysis based on 00 UTC shows a trough at mean sea level from Punjab to west Assam and adjoining areas. Forecasts show the persistence of the trough for all the 5 days and thereby extending along Bihar to GWB and adjoining areas.

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 10⁻¹/s):

The high vorticity belts are mainly over Punjab, UP, Haryana, Gangetic plains, foot hills of Himalaya, parts of Central India, NE states, south peninsula along with isolated pockets over the east coast region.

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): Above threshold values are mostly over Gujarat, Rajasthan, isolated pockets of Bihar, GWB and Odisha Coast during next 5 days.

Lifted Index (< -2): Less than threshold value over most parts of the country except J&K, HP, Uttarakhand, UP, parts of central India, NE states and over major parts of the south peninsula during next 5 days.

Total Total Index (> 50): Greater than threshold value over isolated pockets of northwest India, Delhi and adjoining areas during next 5 days.

Sweat Index (>300): Higher than threshold value almost all over the country except parts of NW India and isolated pockets over Delhi, UP, Bihar, MP and isolated pockets in the South peninsula.

CAPE (> 1000): Mostly over parts of northwest India, central parts of India, West Bengal, Bihar, isolated pockets of Odisha and regions bordering the east coast of the county.

CIN (50-150): Mostly all over the country except J&K, NE states and isolated pockets over the south peninsula region.

5. Rainfall and thunderstorm activity:

20-70 mm rainfall over major regions of Delhi, UP, foothills of the Himalayas, Maharashtra, Odisha, the east coast and west coast and over major regions of the NE states during the next 5 days. 20-70 mm rainfall over parts of Maharashtra, GWB, Odisha, Chhattisgarh and isolated pockets of coastal Andhra Pradesh during next 5 days.

40-70 mm rainfall and more over SHWB, NE states, GWB, Konkan coast, Vidarbha and along the foothills of the Himalayas during the next 5 days and along Delhi and adjoining areas from day4.

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

1. Model Reflectivity (Max. dBz):

15-35 dBZ Model reflectivity over AP, Odisha and major regions of the South peninsula and over NE states valid for today. 15-40 dBz model reflectivity over major regions of NE states and along the foothills of the Himalayas for 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 over major regions of northwest and central parts of India, Gangetic plain and isolated pockets over the east coast during next 72 hours.

K-Index (> 35): Less than threshold value over the entire country during the next 72 hours.

CAPE (> 1000): Mostly over the foothills of the Himalayas, Gujarat, central India, east UP, Bihar, Delhi, Punjab, NE states and major regions bordering the east coast of the country during next 3 days.

CIN (50-150): Over North West parts of India, east UP, Bihar, parts of central India and south peninsula during next three days.

3. Rainfall and thunderstorm activity:

70-130 mm: and more over SHWB, and NE states for the next 72 hours.

20-70 mm: over the foothills of the Himalayas, NE states, west coast, Odisha coast, and parts of Central India for the next 72 hours.

3. IOP ADVISORY FOR 24 and 48Hrs:

Summary and Conclusions:

Day-1 & Day-2:

The northwards movement of the low pressure area to over southwest Bangladesh & neighbourhood will result in heavy rainfall over North east India on day 1 and 2, with extremely heavy rainfall over Meghalaya on day 1. Moisture feeding from this low pressure system along the east peninsular coast will also increase the rainfall over this region on day 1, which is likely to decrease on day 2.

The east west shear zone in the middle troposphere, roughly along latitude 18.0°N, will also increase the rainfall all over central India on day 1 and 2.

The active off shore trough off south Maharashtra coast to Kerala coast, is likely to result in heavy rainfall all along the west coast of India.

In association with the upper air cyclonic circulation over Haryana & neighbourhood, widespread thunderstorm activity is expected over North India on day 1 and 2.

24 hour Advisory for IOP:

Rainfall:

Assam, Meghalaya,
Nagaland, Manipur, Mizoram and Tripura
Arunachal Pradesh
Coastal Andhra Pradesh, Coastal Karnataka
Telangana, South Chhattisgarh, Konkan and Goa
Odisha, Gangetic West Bengal
North Interior Karnataka, Madhya Maharashtra,
Marathwada, Vidarbha

Thunderstorms with associated phenomena

Madhya Pradesh,
Madhya Maharashtra, Marathwada
Entire Uttar Pradesh, Uttarakhand,
North Chhattisgarh
Bihar, Jharkhand

48 hour Advisory for IOP:

Rainfall:

Assam, Meghalaya,
Nagaland, Manipur, Mizoram and Tripura
Arunachal Pradesh
Telangana, South Chhattisgarh
Vidarbha, Coastal Andhra Pradesh
Coastal Karnataka
Konkan and Goa

Thunderstorms with associated phenomena

Uttarakhand, Haryana and Delhi
Madhya Pradesh, Madhya Maharashtra,
Chhattisgarh
Bihar

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)

For Synoptic plotted data and charts

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

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

For RAPID tool:

<http://rapid.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

Upper level winds

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

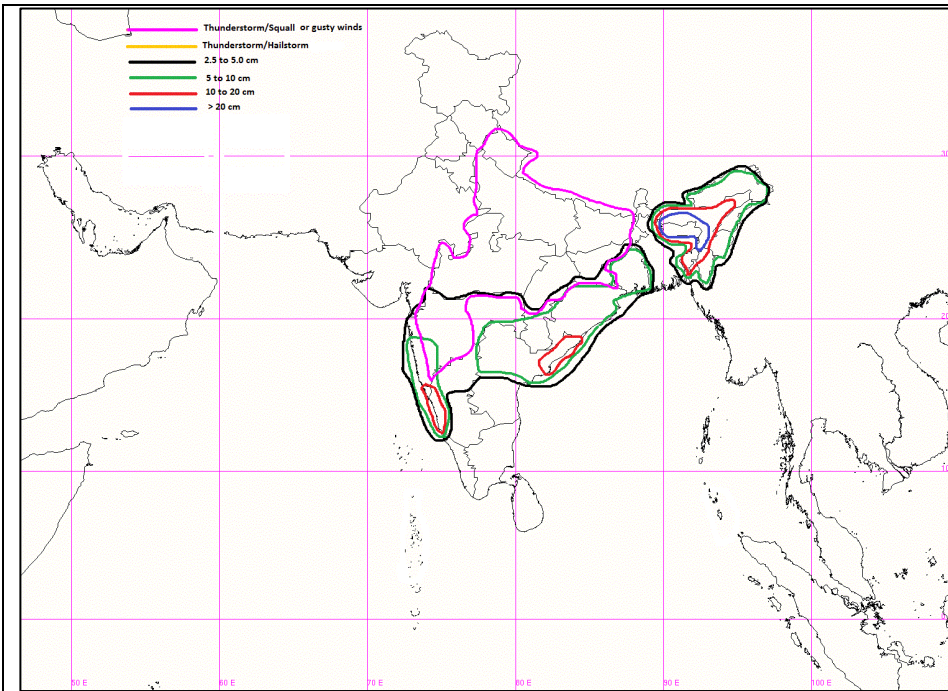
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ForRadarimagesofthepast24hoursincludingmosaicofimages:

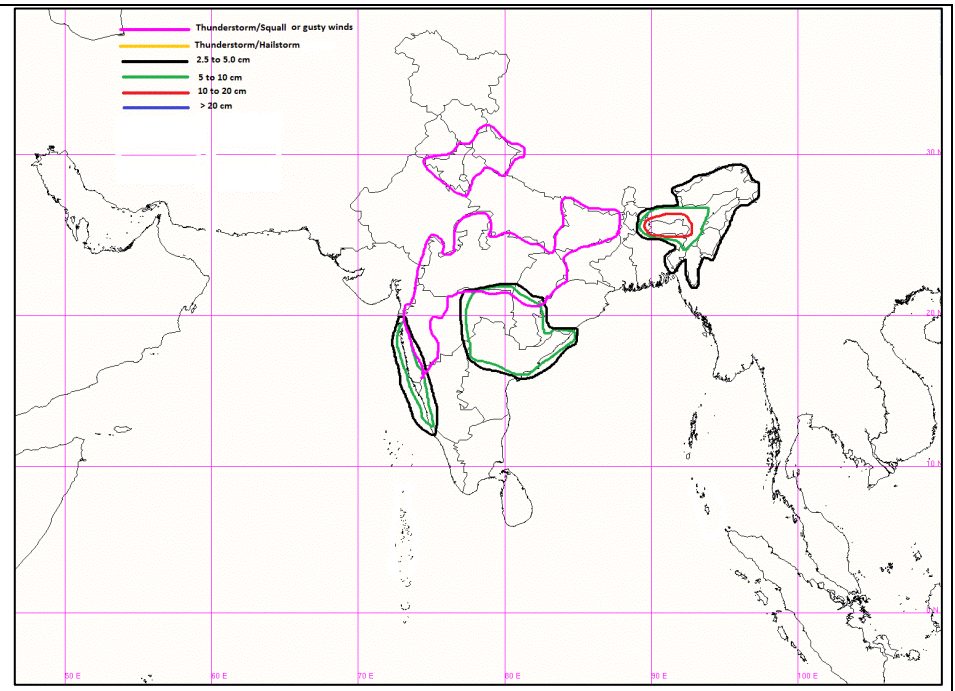
http://ddgmui.imd.gov.in/dwr_img/

Satellite sounder based T- Phigram

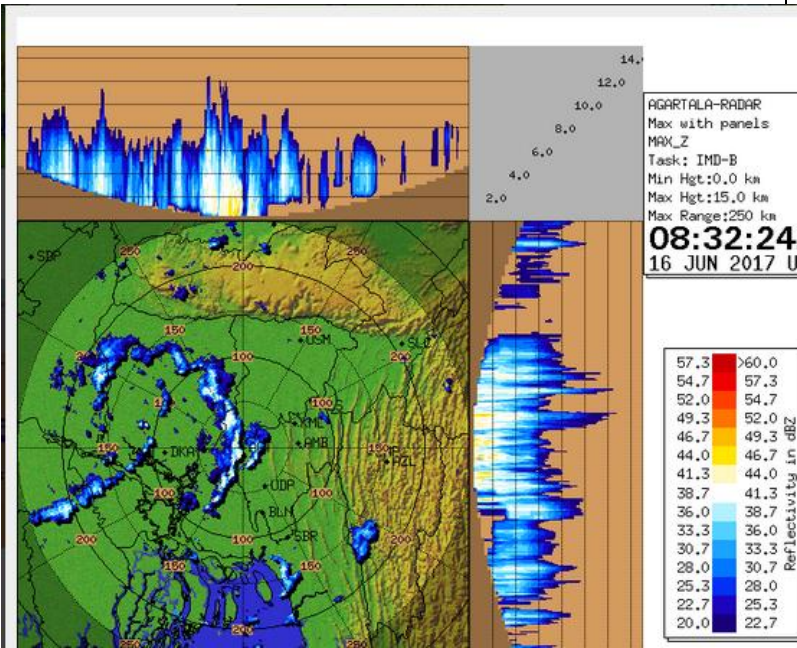
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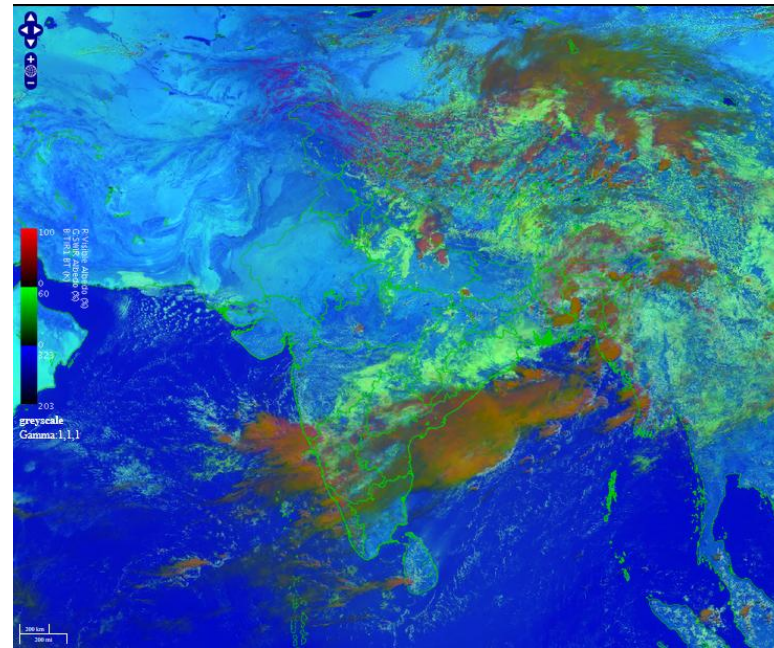
IOP Advisory for 24 hours



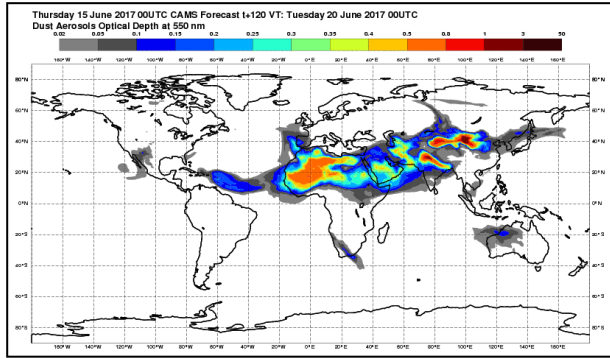
IOP Advisory for 48 hours



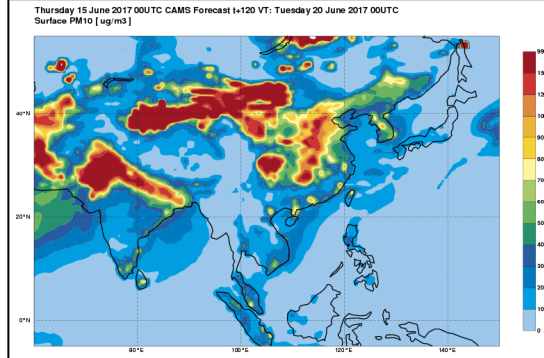
DWR Agartala at 0832 UTC



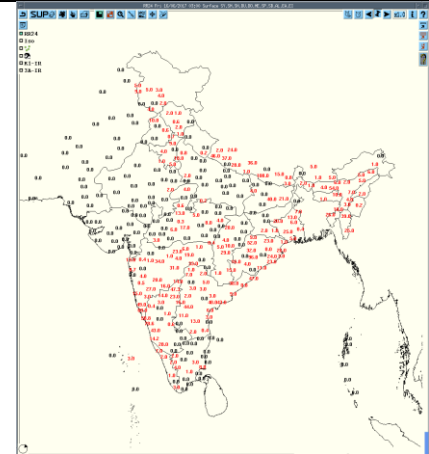
RAPID RGB Satellite Imagery at 1200 hrs IST of today



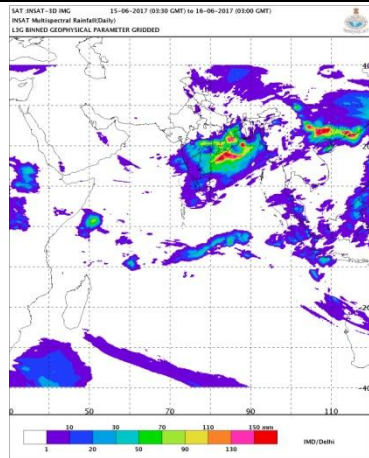
Forecast Dust Concentration for 00UTC of 19th June



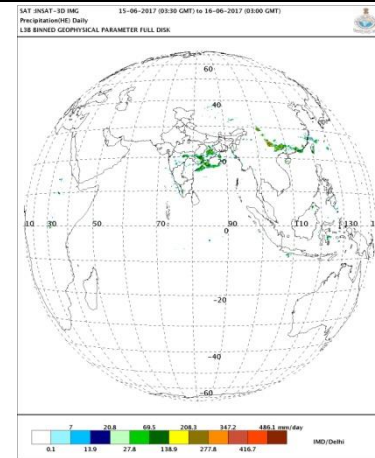
PM10 Forecast for 00UTC of 19th June



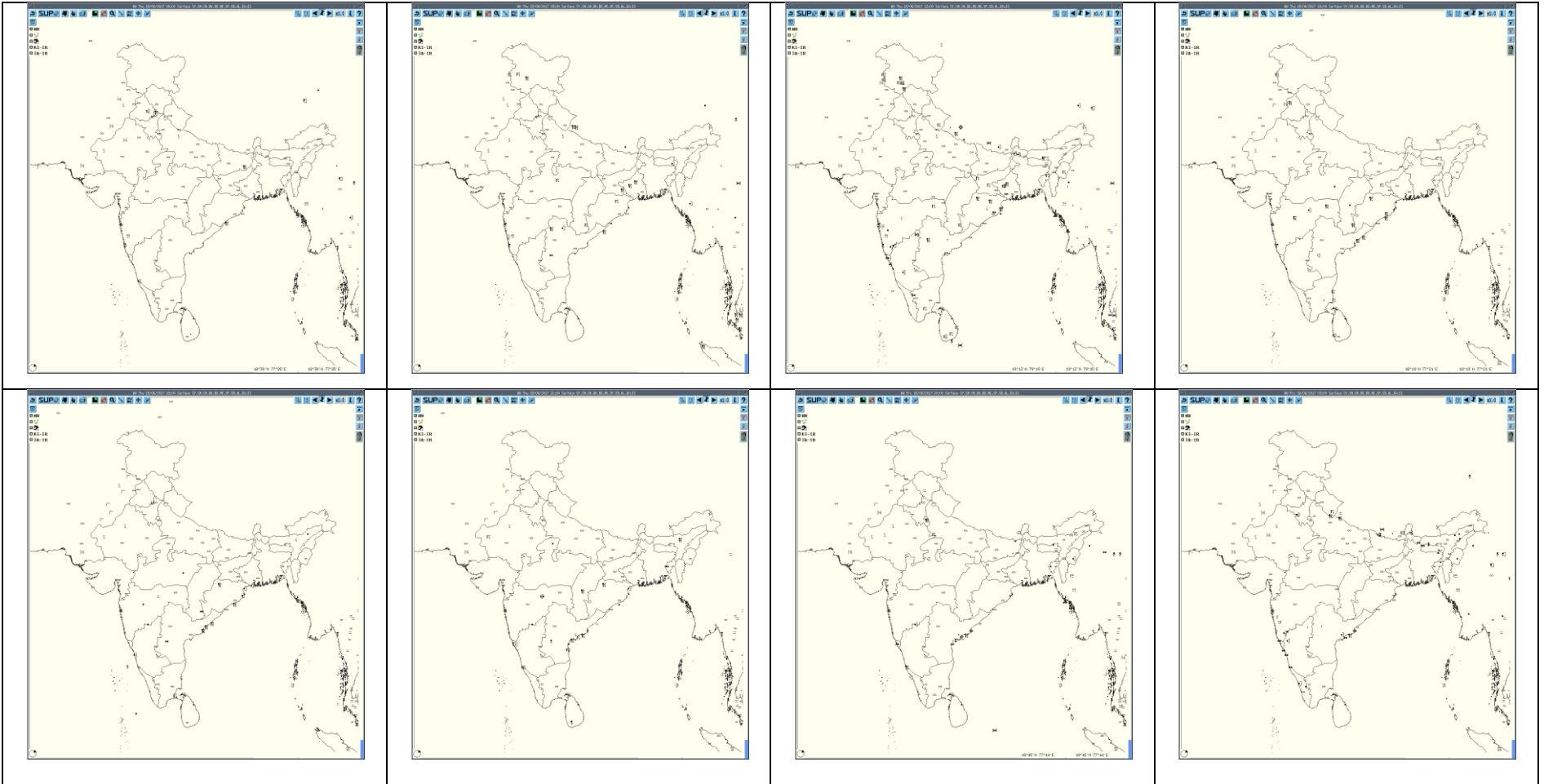
Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today



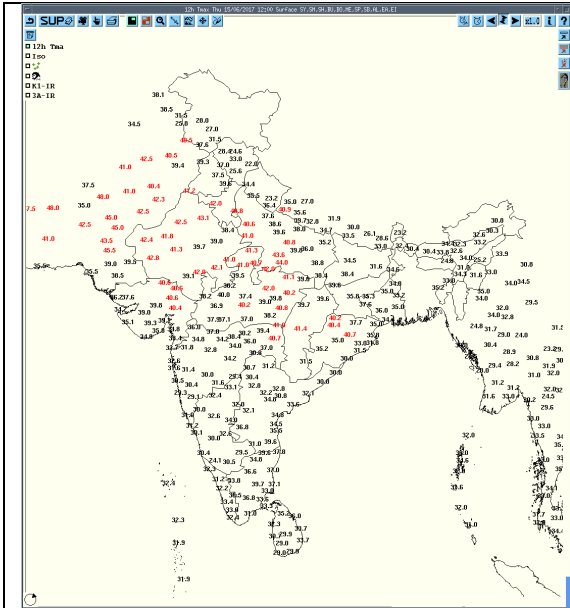
IMR Rainfall



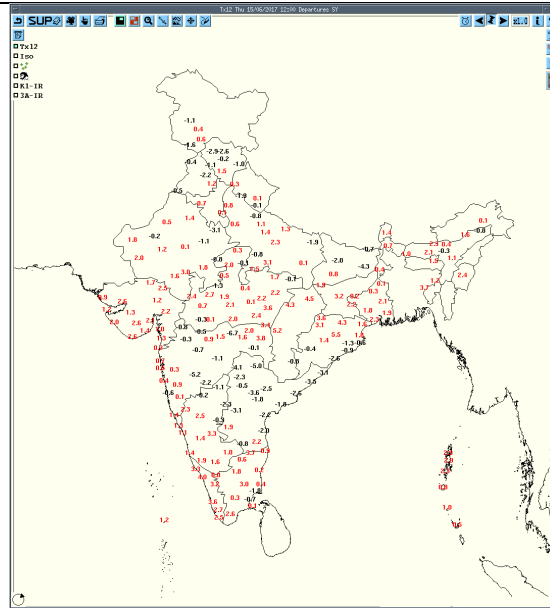
HEM Rainfall



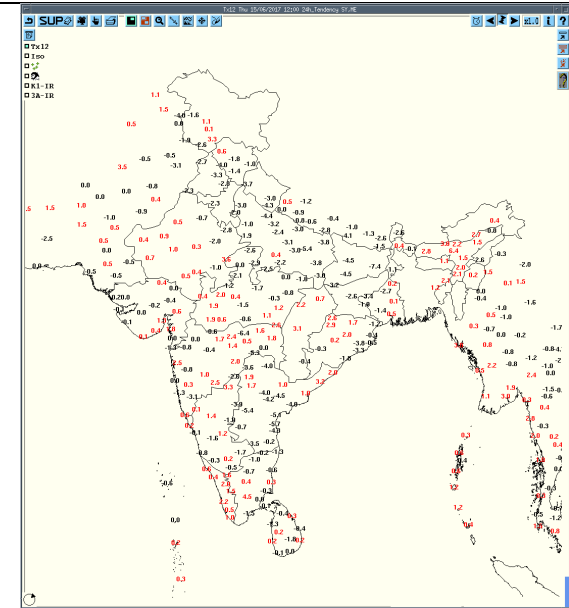
3hourly Past weather at 06, 09, 12, 15, 18, 21UTC of yesterday and 00 & 03 hrs UTC of today



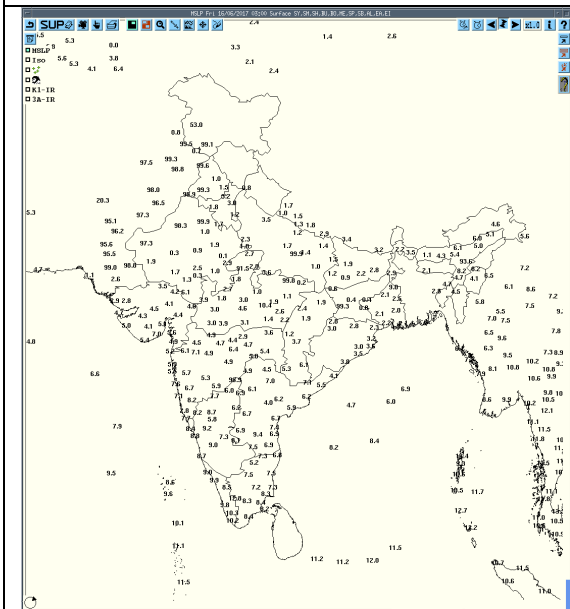
Tmax



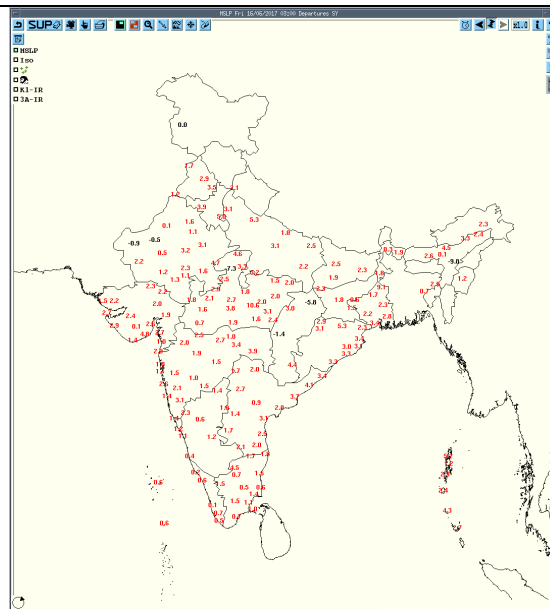
Departure Tmax



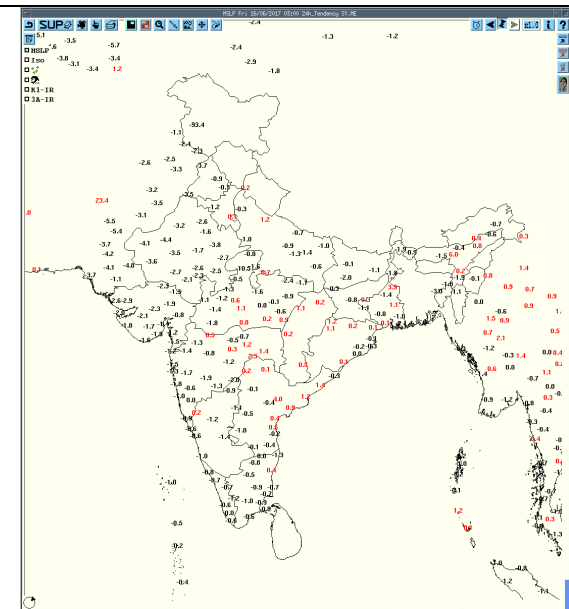
Tendency Tmax



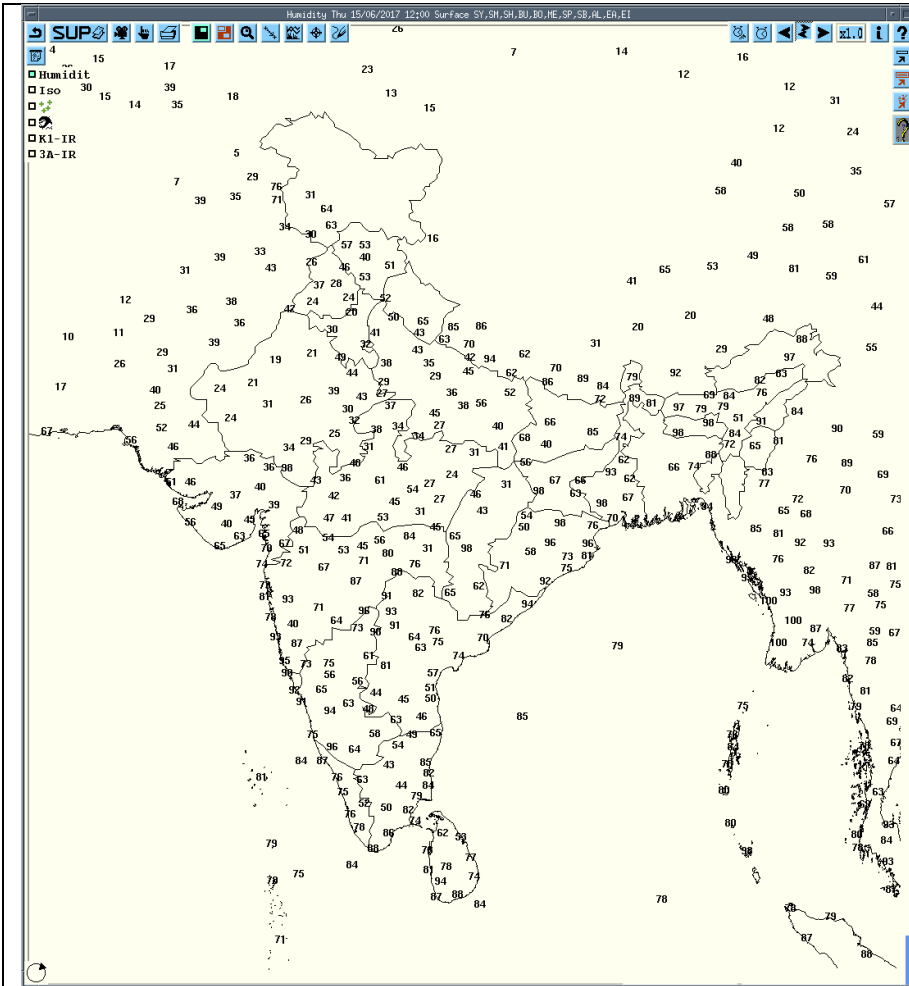
MSLP



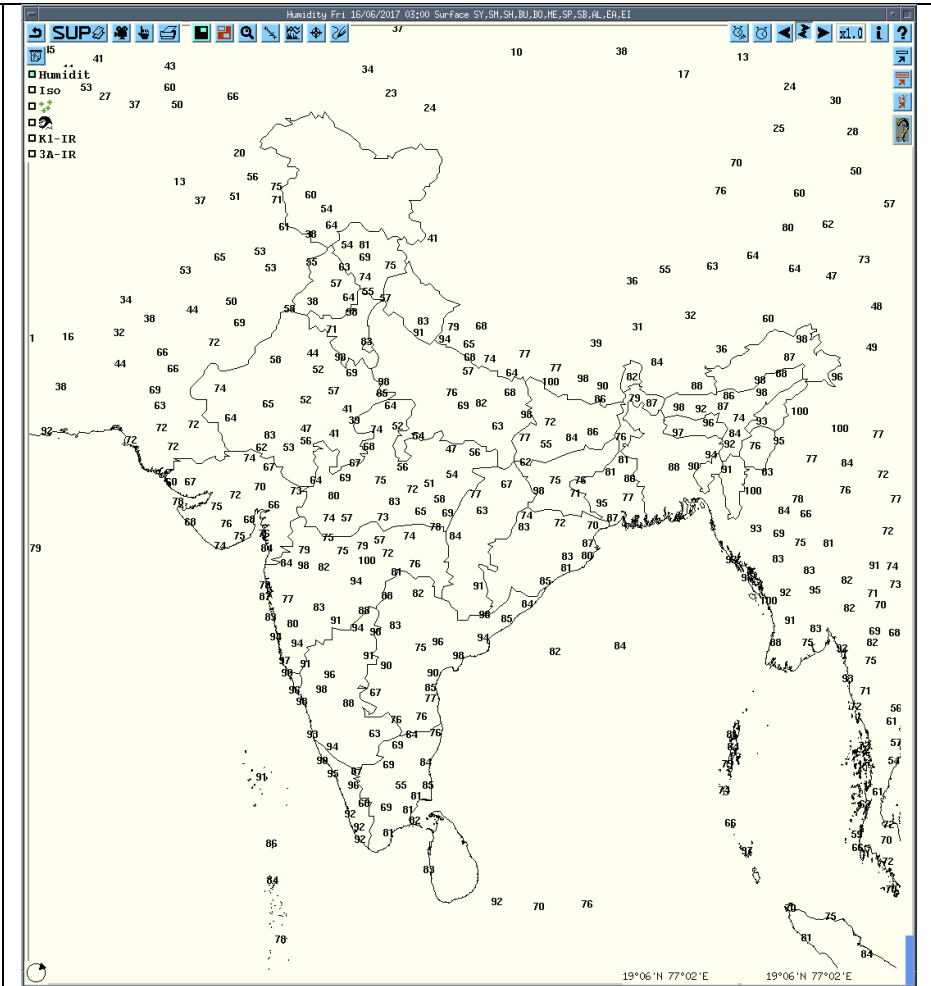
Departure MSLP



Tendency MSLP



RH at 12UTC yesterday



RH at 03UTC today

Realised past 24hrs TS/SQ/HS Data (reported at 0300UTC of the day):

Realized weather past 24hours (Based on SYNERGIE Products)					
ate	Time of Reporting	Name of Station Reporting	Region	STATE	Weather Event
15-06-17	0600UTC	Ludhiana /Chandigarh	NW India	Punjab/Haryana	Thunderstorm
		Bhagalpur /Gopalpur	E India	Bihar/ Odisha	Thunderstorm
15-06-17	0900UTC	Kupwara, Pahalgam,	NW India	J & K	Thunderstorm
		Sagar	C India	Madhya Pradesh	Thunderstorm
		Shanti Niketan, Bankura/ Jamshedpur/ Keonjhargarh	E India	West Bengal/Jharkhand/ Odisha	Thunderstorm
		Jagdapur	C India	Chhattisgarh	Thunderstorm
		Calingapatnam, Nizamabad	S India	Andhra Pradesh	Thunderstorm
15-06-17	1200UTC	Pahalgam, Qazigund, Kukernag, Bhaderwah/ Mukteshwar	NW India	J & K/ Uttarakhand	Thunderstorm
		Panagarh, Bankura/Daltonganj, Ranch	E India	West Bengal/Jharkhand	Thunderstorm
		Jharsuguda, Keonjhargarh, Chandbali/ Angul	E India	Odisha	Thunderstorm/ Lightning
		Jagdapur /Nagpur	C India	Chhattisgarh/Vidarbha	Thunderstorm
		Guwahati/ Imphal/ Kailasahar	NE India	Assam/Manipur/Tripura	Thunderstorm
		Aurangabad	W India	Maharashtra	Lightening
		Hyderabad, Bapatla/ Madurai	S India	Andhra Pradesh/ Tamilnadu	Thunderstorm
15-06-17	1500UTC	Amritsar	NW India	Punjab	Thunderstorm
		Ranchi/ Jharsuguda, Bhubaneswar, Puri	E India	Jharkhand/ Odisha	Thunderstorm
		Vishakhapatnam, Tuni/ Cuddalore, Nagapattinam	S India	Andhra Pradesh/ Tamilnadu	Thunderstorm
		Nagpur	C India	Vidarbha	Thunderstorm
		Aurangabad	W India	Maharashtra	Thunderstorm
15-06-17	1800UTC	Tezpur	NE India	Assam	Lightening
		Jharsuguda, Puri	E India	Odisha	Thunderstorm
		Vishakhapatnam, Tuni, Kakinada/ Tondi	S India	Andhra Pradesh/ Tamilnadu	Thunderstorm
		Akola	C India	Vidarbha	Lightening
15-06-17	2100UTC	Tezpur	NE India	Assam	Thunderstorm
		Jharsuguda	E India	Odisha	Thunderstorm
		Raipur/ Akola	C India	Chhattisgarh/Vidarbha	Thunderstorm
		Vijayawada,	S India	Andhra Pradesh/Karnataka	Lightening
		Narsapur, Machilipatnam, Bapatla, Kavali/ Bajpe	S India	Andhra Pradesh/Karnataka	Thunderstorm
		Akola	C India	Vidarbha	Thunderstorm
16-06-17	0000UTC	Safdarjung, Palam	NW India	Delhi	Thunderstorm
		North Lakhimpur	NE India	Assam	Thunderstorm
		Narsapur, Machilipatnam/ Bajpe	S India	Andhra Pradesh/Karnataka	Thunderstorm
16-06-17	0300UTC	Hissar/ Pantnagar, Mukteshwar	NW India	Haryana/ Uttarakhand	Thunderstorm
		Narsapur	S India	Andhra Pradesh	Thunderstorm

Past 24 hours DWR Report:

Radar Station Name	Date	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
Karaikal	15.06.17	1.1330Z-2300Z	1) cluster of cells in SW direction 220 km range with max reflectivity of 57dBz and Average height of 12 km.	1.Moving in Ely direction with the speed of 20km/hr	1.Cells started forming at 1332 IST and remained upto2312 IST	N/A	N/A
		2.1500Z-2300Z	2) cluster of celsl in WNW direction 150 km range with max reflectivity of 55dBz and Average height of 12 km.	2.Moving in Ely Direction with the speed of 23km/hr	2.Cells started forming at 1312 IST and remained up to 2312 IST		
	16.06.17			Nil			
Jaipur	15.06.17	1022-1152	Multiple cell with average height of 4.5 km & maximum reflectivity 59.0 dBZ	Multiple cell develop from 1022 UTC of 15/06/2017 towards North-East of jaipur and moved to SE Wards at speed 12-15 km/hr	Cell starts forming from 1022 of 15/06/2017 at NE of Jaipur and reaches maximum reflectivity during 1022-1152UTC and died down at 1252 UTC.	Thunderstorm/rain at isolate places	Alwar, Sikar, Dausa, Sawaimadh opur, Karauli
		1322-1342	Two cell with average height of 4.0 km & maximum reflectivity 56.0 dBZ	Two cell develop from 1322 UTC of 15/06/2017 towards North-East of jaipur and moved to South- East Wards at speed 03-05 km/hr	Cell starts forming from 1322 of 15/06/2017 at North-East of Jaipur and reaches maximum reflectivity during 1322-1342 UTC and died down 1352 UTC..	Thunderstorm/rain at isolate places	Alwar, Sikar, Jaipur
		1542-0000	Multiple cell with average height of 5.3 km & maximum reflectivity 60.5 dBZ	Multiple cell from 1542 UTC of 15/06/2017 towards N & NE of jaipur and moved to SE direction at speed 07-10 km/hr	Cell starts forming from 1542 of 15/06/2017 at N & NE of Jaipur and reaches maximum reflectivity during 1542-0000 UTC and cells formation continued.	Thunderstorm/rain at isolate places	Alwar, Bharatpur, Dholpur, Karauli, Churu, Jhunjhunu, Sikar
	16.06.17	0000-0300	Nil				

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
Visakhapatnam	15.06.17	0300 - 0600	Squally line cb cells from SWE to East with max reflectivity 50 dBZ and average height 16kms.	Squally line of cb cells are continued since last observation and moving Easterly.	Max reflectivity on the squally line of cb cells is reduced.	thunderstorms.	
		0600 - 0900	Convective region in NE &E, ESE directions with max reflectivity of 54dBz and Max ht of 15.6 kms.	Convective region moving in E, ESE directions and merging at a distance of 50 to 250 kms from the Radar in the sea.		thunderstorms.	-
		0900 - 1200	Convective region in NE &E, ESE directions with max reflectivity of 52dBz and Max ht of 13.4 kms. A Squall line is seen developing in the NW ly direction with max reflectivity of 58 dBz and Max ht of 16.2 kms	Squall line seen moving in SEly direction and intensifying as it moves.		thunderstorms.	-
		1200 - 1500	CB cells over EAST (68kms) and convective region over NW sector and NNE with max reflectivity 53dbz and average height 14kms.	Moving southerly.	Convective region is going to be continuous.	Thunderstorms and light rain.	-
		1500 - 1800	Convective region in which cb cells are formed over East 20kms from radar with max reflectivity 52dbz and average height 10kms.	Moving SW ly	-	-	-
		1800 - 0000	Squally line of cb cells from SW TO EAST in the bay of Bengal with max reflectivity 58 dBZ and average height 14kms.	Formed at 19:51 UTC/15-06-17 and moving Easterly.	Continuous formation of cb squally line in the sea.	-	-
	16.06.17	0000 - 0300	Squally line of cb cells from SSW TO EAST in the bay of Bengal with max reflectivity 53 dBZ and average height 13kms.	200Km from radar and formed at 19:51 UTC/15-06-17 and moving Easterly.	Continuous formation of cb squally line in the sea and reducing in reflectivity.	-	-

DWR Station	Date	Time interval of observation	Organization of the cells (isolated single cell/multiple cells convective regions/squall lines) with height of 20 dBZ echo top and maximum reflectivity	Formation w.r.t. radar station & direction of movement	Remarks	Associated severe weather, if any	Districts affected
Lucknow	16.06.17	151042 - 151122 -	single cell with average height of 5.8 KM. with Maximum reflectivity of 49 dBZ	N(80KM) From LKN Radar and moving in E'ly direction at speed of 22 km/hr	cell started forming at N(80KM) from LKN Radar at 1032 UTC did not intensified much and dissipated at 1122 UTC at NNE(80KM) from LKN Radar.	TS, rain	Sitapur
		152332 - 160300 -	Multiple cells with average height of 6.5 KM. with Maximum reflectivity of 46 dBZ	N(50KM) and WSW(60KM) From LKN Radar and moving in ESE'ly direction at speed of 22 km/hr	Cells started forming at 2332 UTC at N(50 km) and WSW(60km) matured in size but did not organized into MCS. Remained stable upto 0300 UTC at NE(10-50 KM) from LKN Radar.	TS,RAIN	Lucknow, Sitapur, Barabanki, Kanpur, Unnao
		160142 - 160300 -	Single isolated cell with average height of 6KM with Maximum Reflectivity of 44dBZ	N(140KM) From LKN Radar and moving in ESE'ly direction at speed of 23 km/hr	Cell started forming at 0142 UTC at N(140 km) from DWR LKN matured in size and weakened down at 0242 UTC.	TS,RAIN	Lakhimpur Kheri
Patna	16.06.17	150300 - 150345	NIL	NIL	N/A	N/A	N/A
		150345 - 150545	Multiple Cells. Maximum Reflectivity : 38.5 dBZ Echo Top : 9 KM	Range: 191.5 KM from DWR Patna in SE direction. Movement- South-Easterly	Warning E-mail and Fax sent to State Disaster management Authority and Concern DMs	N/A	Munger, Lakhisarai, Jamui, Bhagalpur, Banka
		150545 - 151930	NIL	NIL	N/A	N/A	N/A
Bhuj	16.06.17	150430 - 151200	NIL	NIL	NIL	NIL	NIL

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
Agartala	16.06.17	151000 - 151722	Multiple cells formed North of DWR Agartala at a distance of 70km with Maximum cell Height 14 km and maximum reflectivity 43 dBZ at 1232 UTC	Formed north of DWR Agartala at a distance of 70km and moves towards north direction with around 38 kmph.	Dissipated in East Meghalaya at 1722 UTC	N/A	N/A
		151920 - 152120	Multiple cells formed South of DWR Agartala at a distance of 100 km with Maximum cell Height 08 km and maximum reflectivity 35.5 dBZ at 1920 UTC	Formed 100 km South of DWR and moved N-wards at around 60kmph	Dissipated in Tripura at 2120 utc	N/A	N/A

Radar Station name DWR Machilipatnam	Date	Time interval of observation (UTC)	Organization of the cells (Isolated single cells/multiple cells/ convective regions/ squall lines) with height of 20dBZ echo top and maximum reflectivity	Formation w.r.t radar station and Direction of movement	Remarks	Associated severe weather if any	Districts affected
	03Z of 15.06.20 17 to 03Z of 16.06.20 17	0751 to 1141UTC	Isolated Multiple cells average height of 10.0km with maximum reflectivity of 59.0dBZ.	NW(189Km) and stationary.	Cell started forming at 0751 UTC, at NNW(166 km) from Radar the maximum reflectivity during 1011 UTC to 1111 UTC and died down at 1141 UTC	Possibility of Thunder storm with rain and winds.	Suryapet, Bhadradi-Kothagudem Districts.
	03Z of 15.06.20 17 to 03Z of 16.06.20 17	0801 to 1001UTC	Isolated Multiple cells average height of 6.0 km with maximum reflectivity of 55.5dBZ.	W(94.9Km) and moving E ly direction with average speed of 15.0kmph	Cell started forming at 0801UTC, at W (163 km) from Radar the maximum reflectivity during 0841UTC to 0901 UTC and died down at 1001.	Possibility of Thunder storm with rain and winds.	Guntur district.
	03Z of 15.06.20 17 to 03Z of 16.06.20 17	0801 to 1801UTC	Convective region-(intensities- 55.5dBZ) Ht=6.0Km	NE (157KM) and moving SW ly direction with average speed of 30.0kmph	Cell started forming at 1301UTC, at NE (221km) from Radar the maximum reflectivity during 1501UTC to 1801 UTC and died down at 1801 UTC	Possibility of Thunderstorm with rain and winds.	Visakhapatnam, East Godavari Districts.
	03Z of 15.06.20 17 to 03Z of 16.06.20 17	1751 to 0141UTC	Convective region-(intensities- 56.0dBZ) Ht=6.6Km .Later merged with cells in the NE direction and dissipated into the sea.	NW (48.6KM) and moving NE ly direction with average speed of 4.0kmph	Cell started forming at 1751UTC, at SW (232km) from Radar the maximum reflectivity during 2031UTC to 2131 UTC and died down at 0141 UTC.	Possibility of Thunder storm with rain and winds.	Nellore, Prakasam, Guntur, Krishna and west Godavari Districts .

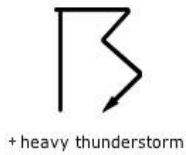
Radar Station name	Date	Time interval of observation (UTC)	Organization of the cells (Isolated single cells/multiple cells/ convective regions/ squall lines) with height of 20 dBZ echo top and maximum reflectivity	Formation w.r.t radar station and Direction of movement	Remarks	Associate d severe weather if any	Districts affected
Patiala	16.06.17	15/0300 15/0600	Multiple cells Max dbz=54.5 Ht.= 9-11 KMS	N & NE Sector Movement SE Wards		TS/RA	Hoshiarpur, Ropar, Bdam, Morinda, Sirhind, Nahan, Patiala, Ambala.
		15/0600 15/0900	Multiple cells Max dbz=51.5 Ht.= 9-13 KMS	NW & N & E Sector Movement SE Wards		TS/RA	Hailstorm Possibility In Dehradun, Rishikesh
		15/0900 15/1200	Multiple cells Max dbz=51.5 Ht.= 6-7 KMS	N & NE Sector Movement SE Wards		TS/RA	Uttarkashi, Gangotri, Dharamshala, Palampur
		15/1200 15/1500	Multiple cells Max dbz=51.0 Ht.= 7-8 KMS	NW Sector Movement SE Wards		TS/RA	Amritsar, Dasua, Patti, Tarantaran, Gurdaspur
		15/1500 15/1800	ISOLATED cell Max dbz=48.5 Ht.= 10-11 KMS	NW Sector. Movement SE-Wards.	-----	RA/TS	Patti, Zira, Ferozpur, Kapurthala, Jalandhar, Moga, Faridkot.
		15/1800 15/2100	Multiple cells Max dbz=45.0 Ht.= 6-7 KMS .	NW Sector. Movement SE-Wards.		RA/TS	Jagraun, Halwara, Malerkotla,, Dhuri, Barnala, Mansa, Sanaur, Kothguru
		15/2100 16/0000	Multiple cells Max dbz=53.5 Ht.= 10-12 KMS	Movement ESE-Wards.	-----	RA/TS	Tohana, Nirwana, Panipat, Jind, Sonipat, Rohtak,Bhiwani, Delhi, Jhajjar
		16/0000 16/0300	Multiple cells Max dbz=56.0 Ht.= 7-10 KMS	Movement SE-Wards.	-----	RA/TS	Pehowa, Tohana, Jind, Bhiwani, Jhajjar, Nabha, Sanaur, Kaithal, Devigarh And Adj. Areas.

Radar Station name	Date	Time interval of observation (UTC)	Organization of the cells	Formation w.r.t radar station and Direction of movement	Remarks	Associated severe weather if any	Districts affected
Nagpur	15/06/17	0302-0332 0342-0622 0628-0842 0752-2352	Single Multiple Multiple Multiple	239km S, moving towards Sw 170 km Sw direction 85km S, moving towards SW 74km W direction moving towards SE.	Max Z=41 ht of cloud= 5.8-6.2 km. Max =37 ht of cloud 3.5-5.8km Max Z=55 ht of cloud 2.3-8.0 km Max Z=56 ht.of cloud 1.5- 10.5	<u>Hail storm</u> warning started at 0742 till 0842 in SE dir 80 km. away from radar. 0912 NW dir 70 km. away from radar. 1002 SE dir 150 km away from Radar. <u>Thunderstorm</u> Warning started at 0628 - 0742 in NW direction 240 km away from radar. 0752 - 0812 in S-SE direction 140 km. away from Radar. 0832 - 1032 in NW direction 230 km away from Radar. 1122 - 1132 in S-SE direction. 240 km away from Radar. 0952-1252 in W-SW direction. 200km away from Radar.	Rainfall isolated places in Bramhapuri, Chandrapur, Adilabad, Nandad, Pusad ,Hingoli, Yeaotmal , washim , Akola, Amraoti etc.
	16/06/17	0232-0252	Multiple	213km SE direction	Max Z=37 ht.of cloud 3.5-5.8km		

Radar Station Name	Date	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. radarstation and Direction of movement	Remarks	Associated Severe Weather if any	Districts affected
Kolkata	15.06.17	0312-0452	NIL	NIL	NO SIGNIFICANT ECHO	NIL	NIL
		0501-1602	1.Small Isolated multiple cells developed with maximum reflectivity of 59.0 dBz at 0621 UTC and maximum height 17.28 km at 0621 UTC	1.NW (232.7 km) to NNW (235.5 km) moving SE-ly	1.Isolated single/multi cells started forming from NW (232.7 km) to NNW (235.5 km) from radar in between from 0501 UTC to 0552 UTC, Matured merged with cell No. 2.	Thunderstorm /Rain	N/A
			2. Small Isolated multiple cells developed with maximum reflectivity of 59.0 dBz at 0652 UTC and maximum height 14.15 km at 0642 UTC	2. WNW (241.3 km)) moving SSE-ly	2. Isolated single/multi cells started forming in WNW (241.3 km) from radar at 0601 UTC, Matured and merged with cell no. 1	Thunderstorm /Rain	N/A
			3. Multi celled system with maximum reflectivity of 61.0 dBz at 0841 UTC and maximum height more than 18 km at 0831 UTC	3. WNW (199 km)) moving SE-ly	3. Cell No. 1. & 2 merged to form multi celled system at 0741 UTC in WNW (199 km) from radar. Matured and dissipated at 1511 UTC in WSW at a distance of 136 km from Radar.	Thunderstorm Hail /Rain	N/A
		0501-1602	4. Small Isolated multiple cells developed with maximum reflectivity of 55.5 dBz at 1151 UTC and maximum height 12.27 km at 1151 UTC	4. W(30 km) to N (67 km) moving NW-ly then S-ly then SE-ly	4. Isolated single/multi cells started forming from W (30 km) to N (67 km) from Radar at 1121 UTC , Matured Dissipated at 1411 UTC in SSW at a distance of 20 km from radar	Thunderstorm /Rain	N/A
			5. Isolated cells converted to multi celled system with maximum reflectivity of 55.5 dBz at 1241 UTC and maximum height 11.82 km at 1341 UTC	5. SE (123 km)	5. Isolated single cells started forming in SE (123 km) from Radar since 1031 UTC, Not matured dissipated at 1602 UTC in SSE at a distance of 40 km from radar	Thunderstorm /Rain	N/A
		1612-2041	NIL	NIL	NO SIGNIFICANT ECHO	NIL	NIL
		2051 – 2302	6. Isolated small cells with maximum reflectivity of 50.0 dBz at and maximum height 7.7 km at 2112 UTC	6. NNE/34 km to ENE/31 km moving in ESE – ly direction	Isolated small cells started forming in between NNE/34 km and ENE/31 km from Radar since 2051 UTC. Not matured dissipated at 2302 UTC in E at a distance of 47 km from radar	Thunderstorm /Rain	N/A
		2312 - 2351	NIL	NIL	NO SIGNIFICANT ECHO	NIL	NIL
		16.06.17	0001 - 0301	NIL	NIL	NO SIGNIFICANT ECHO	NIL



+ thunderstorm



+ heavy thunderstorm



sandstorm or dust storm



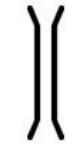
squall



hail shower



tropical storm



+ tornado



+ lightning



+ hurricane

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∞	haze
☁	smoke
☄	dust or sand storm
☁	fog
☂	drizzle
•	rain
⊛	snow
☔	showers
⚡	hail
☄	thunderstorm

Weather Symbols