



India Meteorological Department

FDP STORM Bulletin No. 35 (10-04-2018)

1. CURRENT SYNOPTIC SITUATION:

NWFC INFERENCE (0300UTC of the Day):

- ◆ The Western Disturbance as an upper air cyclonic circulation at 3.1 km above mean sea level over Afghanistan & adjoining Iran now lies over Afghanistan & neighbourhood with the trough aloft with its axis at 5.8 km above mean sea level running roughly along Long 64° E to the north of Lat 30°N.
- ◆ The other Western Disturbance as an upper air cyclonic circulation at 3.1 km above mean sea level over Pakistan and adjoining Jammu & Kashmir has moved away northeastwards.
- ◆ The cyclonic circulation over north Haryana and adjoining west Uttar Pradesh now lies over northwest Uttar Pradesh and neighbourhood and extends upto 0.9 km above mean sea level.
- ◆ A cyclonic circulation lies over East Uttar Pradesh & adjoining Bihar and extends upto 0.9 km above mean sea level.
- ◆ The trough in westerlies now runs roughly along Long. 88° E to the north of Lat. 22°N between 3.1 km & 5.8 km above mean sea level.
- ◆ The cyclonic circulation over northern parts of Bangladesh and neighbourhood persists and now seen between 1.5 km and 3.1 km above mean sea level.
- ◆ The trough in easterlies from southeast Arabian Sea to south Madhya Maharashtra has become less marked.
- ◆ A north south wind discontinuity runs from north interior Tamilnadu to north Interior Karnataka across south Interior Karnataka at 0.9 km above mean sea level.
- ◆ The cyclonic circulation over south Gujarat region & neighbourhood now lies over Gujarat Region and extends upto 0.9 km above mean sea level.
- ◆ The cyclonic circulation over southwest Madhya Pradesh and neighbourhood extending upto 0.9 km above mean sea level persists.
- ◆ A trough of low at mean sea level lies over Equatorial Indian Ocean & adjoining southeast Bay of Bengal.

SATELLITE OBSERVATIONS during past 24 hrs and current observation:

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

Western Disturbance (WD):

Scattered multi-layered clouds with embedded moderate to intense convection seen over Central Pakistan, Jammu & Kashmir, Northwest Himachal Pradesh, Punjab and West Rajasthan and over area between Lat 37.0N to 43.0N Long 75.0E to 90.0E in association with Western Disturbance over the area.

Westerly Trough: Trough in Westerlies roughly along long 86.0E & north of lat 25.0N

Convective Activity:

Cell No	Date /Time (UTC)	Location	Minimum CTT -Deg C	Remarks/ Movement
1	10/0200	Southwest Jammu & Kashmir	68	Developing
	0300	-DO-	70	Expanding /ENE- wards
2	10/0100	Central Assam	45	-
	0200		43	-
	0300		43	Developing /ENE- wards
3	10/0100	Northeast Uttar Pradesh	53	Developing /E- wards
	0200	Northeast Uttar Pradesh adjoining Northwest Bihar	48	-
	0300	-DO-	46	Weakening

Clouds descriptions within India:

Scattered low/medium clouds with embedded moderate to intense convection seen over Jammu & Kashmir (**Minimum CTT Minus 62 Deg C**), Northwest Himachal Pradesh (**Minimum CTT Minus 40 Deg C**), Northeast Uttar Pradesh (**Minimum CTT Minus 47 Deg C**), Northwest Bihar, West Arunachal Pradesh, Assam, East Meghalaya, Nagaland, Manipur, Northwest Rajasthan and Northwest Madhya Pradesh. Scattered low/medium clouds with embedded weak to moderate convection seen over rest Himachal Pradesh, North Uttarakhand, Punjab, Haryana adjoining Uttar Pradesh, Odisha, Southwest Bihar, Sub-Himalayan West Bengal, Sikkim, rest Northeast state, East Rajasthan, rest Madhya Pradesh, Central Maharashtra and Nicobar Islands.

Arabian Sea:-

Isolated low/medium clouds with embedded moderate to intense convection seen over extreme Southwest Arabian Sea and Isolated low/medium clouds with embedded weak to moderate convection seen over Southeast Arabian Sea.

Bay of Bengal & Andaman Sea:

Scattered low/medium clouds with embedded moderate to intense convection seen over Southeast Bay and Andaman Sea.

Past Weather:

Convection (during last 24 hrs):

Moderate to Intense convection was observed over Jammu & Kashmir Punjab Himachal Pradesh north Rajasthan Haryana Delhi Uttarakhand Uttar Pradesh Bihar Jharkhand Chhattisgarh Odisha Gangetic West Bengal Sub-Himalayan West Bengal Sikkim NE States Kerala Tamilnadu.

OLR: Up-to 230 wm^{-2} observed over Jammu & Kashmir Himachal Pradesh Uttarakhand Punjab north Rajasthan Haryana north-east Uttar Pradesh adjoining Bihar, Sikkim, Northeast States, Kerala and South Tamilnadu.

Synoptic Features (Westerly Trough & Jet Stream): Trough in Westerlies roughly along Long 86.0E & North of Lat 25.0N.

Dynamic Features:-Up to 20- 30 Knots wind shear is observed over North-West India and Up to 40 Knots wind shear observed over rest India. Negative Shear tendency (**-20kts**) is observed over North-central Uttar Pradesh and Positive Shear tendency (**20kts**) over rest India.

A positive Vorticity field at 850 hPa is observed over west Gujarat north-west Uttar Pradesh (.)

Negative Low Level Convergence observed over Jammu & Kashmir to Bihar Gujarat central India Arunachal Pradesh and Positive Low Level Convergence observed over Maharashtra Madhya Pradesh and Chhattisgarh.

Convective Activity over Indian Region:

Cell No	Date /Time (UTC)	Location	Minimum CTT -Deg C	Remarks/ Movement
1	09/0700	SE JHRKND ADJ WB ADJ ORS	41	DEVELOPING
	0800	SE & N JHRKND ADJ WB ADJ ORS	51	
	0900	DO	44	
	1000	NE JHRKND ADJ BHR ADJ GWB	46	
	1100	DO	60	
	1200	DO	59	
	1400	N GWB ADJ BD	59	
	1500	DO	53	E-WARD
	1600	E GWB ADJ BD	49	
	1700	C BD	48	DISSIPATING
	2130	MEGHA W ASSAM N SHWB	51	NE-WARD
	2300	DO	52	
	2330	ASSAM E MEGHA NAGA MANI	50	E-WARDS
		10/0100	DO	
2	09/0700	C ORS	37	DEVELOPING
	0800	DO	37	
	0900	DO	41	
	1000	C ORS ADJ GWB	57	
	1100	DO	63	
	1200	DO	55	
	1400	----	----	DISSIPATED
3	09/0700	EC TN	48	DEVELOPING
	0800	DO	55	
	0900	DO	54	
	1000	DO	--	DISSIPATED
4	09/1100	W GUJ	44	DEVELOPING
	1200	DO	48	
	1400	SE GUJ	47	
	1500	----	----	DISSIPATED
5	09/1200	W RAJ	64	DEVELOPING
	1400	DO	69	NE-WARDS
	1500	NW RAJ	68	E-WARDS
	1600	DO	65	
	1700	NW RAJ ADJ W HARY SW PJB	66	NE-WARDS
	2130	NW RAJ S PJB HARY DLH	50	E-WARDS
	2300	DO	49	
	2330	NW RAJ S PJB HARY ADJ NW UP DLH	50	E-WARD & DISSIPATING
		10/0100	DO	41
	0200	DO		DISSIPATED

Cell No	Date /Time (UTC)	Location	Minimum CTT -Deg C	Remarks/ Movement
6	09/2300	NE UP	59	DEVELOPING
	2330	DO	59	EXPANDING
	10/0100	DO	53	E-WARD
7	10/0200	SW J & K	68	DEVELOPING
	0300	DO	70	ENE-WARD EXPANDING
8	10/0100	C ASSAM	45	
	0200	DO	43	
	0300	NC ASSAM	43	ENE WARD DEVELOPING
9	09/2300	NE UP	59	DEVELOPING
	2330	DO	59	EXPANDING
	10/0100	DO	53	E-WARD
	0200	NE UP ADJ NW BHR ADJ NEPAL	48	
	0300	DO	46	WEAKENING

Precipitation:

HEM:

Rainfall upto 70 mm observed over W Jammu and Kashmir SE Himachal Pradesh NW Uttarakhand N sub Himalayan west Bengal

Rainfall upto 20 mm East Madhya Pradesh Orissa south Chhattisgarh Kerala NE Karnataka and Meghalaya

Rainfall upto 14 mm observed over west Gujarat North West Rajasthan north central and west Uttar Pradesh Jharkhand Bihar west Bengal Assam

IMR:

Rainfall upto 50 mm observed over W Jammu and Kashmir

Upto 30 mm north west Rajasthan

Upto 20 observed over Uttarakhand Uttar Pradesh Gangetic West Bengal

Rainfall upto 10 mm observed over Himachal Pradesh Punjab Haryana west Gujarat Jharkhand SE Bihar west Bengal Assam Arunachal Pradesh Meghalaya coastal Tamilnadu east central Kerala

RADAR and RAPID RGB Observation:

Isolated/multiple light to moderate echoes (dBZ 45-50 and height around 10km) are seen on DWR Bhopal, Delhi, Agatala, Jaipur, Gopalpur, Kolkata, Nagpur, Pradip, Patna, Patiala and Vishakhapatnam domains at around 1715 IST.

RAPID RGB Satellite imagery at 1600IST indicates significant convection over Jammu & Kashmir, Punjab, Himachal Pradesh, Uttarakhand, West Rajasthan, Central parts of Bihar, East Jharkhand, Vidarbha, South Chhattisgarh, South Odisha, North Coastal Andhra Pradesh, Marathwada, Coastal and South Interior Karnataka.

Environmental Condition (dust etc) and its Forecast based on 00UTC of date:

Higher Dust concentration was observed over Arab countries and western part of India. Dust concentration is expected to increase over north-western part of India for next few days.

Particulate matter concentration is expected to remain in moderate category for next 2 days in Delhi.

Delhi – SAFAR analysis & Forecast	10.04.2018	11.04.2018
PM10 (micro-g/m ³)	158	147
PM2.5 (micro-g/m ³)	66	61

2. NWP MODEL GUIDANCE:

NCMRWF (NCUM forecast based on 00UTC the day):

1. Weather Systems:

Low level CYCIRS, Troughs: 12 UTC of Day 0-1: 925 & 850 hPa a weak CYCIR over Punjab and adjoining Pakistan

12 UTC of Day 0-2: 925 & 850 hPa trough over Gujarat region

00 UTC of Day 1-5: 850 hPa trough over Bihar/WB moving eastward lying over Bangladesh and NE India in Day 2-4

Confluence & wind Discontinuity regions:

12 UTC of Day 0-1: 925hPa SW-NE discontinuity over MP-Chhattisgarh, Jharkhand and N-S discontinuity over Southern Peninsular India

Synoptic Systems: 00 UTC of Day 1-3: WD as a trough at 500 hPa over Pakistan moving eastward and lies over J & K in Day 2-3. A fresh WD approaching J & K in Day 5

00UTC of Day 1-5: 925 hPa anticyclone over Bay of Bengal leading to moisture incursion. Winds are stronger in Day 3-4

2. Location of jet and jet core (>60kt) at 500hPa: 12UTC - Nil (>50kts) Day- 3 UP, Bihar and NE states Day 4: Bihar and NE states

3. Convergence at 850 hPa: Day/Index: Subdivisions with Lower Level Convergence > 15 x 10⁻⁵ /s

Day0: Haryana, Chandigarh, Delhi, Punjab, West Rajasthan, Odisha, East MP, Madhya Maharashtra, SI Karnataka,

Day1: West UP, Uttarakhand, Punjab,

Day2: Assam Meghalaya, West UP, Jammu Kashmir, Madhya Maharashtra, Marathwada, Tamilnadu Puducherry, NI Karnataka, SI Karnataka,

Day3: Arunachal Pradesh, Assam Meghalaya, East Rajasthan, West MP, East MP, Madhya Maharashtra, NI Karnataka, SI Karnataka,

Day4: Arunachal Pradesh, Assam Meghalaya, West UP, Odisha, East MP, Madhya Maharashtra, Tamilnadu Puducherry, NI Karnataka, SI Karnataka,

4. Low level Vorticity:-Positive Vorticity: Day/Index: Subdivisions with Lower Level Vortex > 15 x 10⁻⁵ /s

Day0: Jharkhand, Uttarakhand, Saurashtra Kutch,

Day1: Arunachal Pradesh, Assam Meghalaya, West UP, Uttarakhand, Punjab,

Day2: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Uttarakhand, Himachal Pradesh,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Bihar, Uttarakhand, Himachal Pradesh, NI Karnataka,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, West UP, Uttarakhand, Himachal Pradesh, Madhya Maharashtra, NI Karnataka

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

Day0: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha, Saurashtra Kutch, Konkan Goa, Coastal AP, Coastal Karnataka, SI Karnataka, Kerala,

Day1: Arunachal Pradesh, Sub Himalayan WB, Bihar, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, Tamilnadu Puducherry, Coastal Karnataka, SI Karnataka, Kerala,

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, Uttarakhand, Odisha, Tamilnadu Puducherry, SI Karnataka, Kerala,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Bihar, Tamilnadu Puducherry, SI Karnataka, Kerala,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jammu Kashmir, Odisha, Tamilnadu Puducherry, SI Karnataka, Kerala,

6. 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, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan, East Rajasthan, Odisha, West MP, Saurashtra Kutch, Konkan Goa, Chhattisgarh, Coastal Karnataka,

Day1: Arunachal Pradesh, Sub Himalayan WB, Bihar, East UP, West UP, Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh, Jammu Kashmir, West Rajasthan, East MP, Marathwada, Vidarbha, Chhattisgarh, NI Karnataka,

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, Chhattisgarh,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, Uttarakhand, Himachal Pradesh, Jammu Kashmir, Odisha,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Jammu Kashmir, Odisha,

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

Day0: Arunachal Pradesh, Sub Himalayan WB, Uttarakhand, Punjab, Himachal Pradesh, Jammu Kashmir, Odisha, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Tamilnadu Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day1: Arunachal Pradesh, NE NMMT, Sub Himalayan WB, West UP, Uttarakhand, Punjab, Odisha, East MP, Marathwada, Vidarbha, Chhattisgarh, Coastal AP, Telangana, Rayalaseema, Tamilnadu Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka,

Day2: Arunachal Pradesh, Assam Meghalaya, Sub Himalayan WB, Gangetic WB, Jharkhand, Bihar, East UP, West Rajasthan, Odisha, Chhattisgarh, Coastal AP, Telangana, Rayalaseema, Tamilnadu Puducherry, Coastal Karnataka, NI Karnataka, SI Karnataka, Kerala,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Gangetic WB, Jharkhand, Odisha, Chhattisgarh, Telangana, Tamilnadu Puducherry, Coastal Karnataka, SI Karnataka,

Day4: Arunachal Pradesh, Assam Meghalaya, Gangetic WB, Jharkhand, Odisha, Coastal AP, Telangana, Tamilnadu Puducherry, SI Karnataka, Kerala,

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

Day1: Arunachal Pradesh, Sub Himalayan WB, Bihar, Uttarakhand, Jammu Kashmir, Tamilnadu Puducherry, Kerala,

Day2: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, West UP, Uttarakhand, Punjab, Jammu Kashmir,

Day3: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Sub Himalayan WB, Jammu Kashmir,

Day4: Arunachal Pradesh, Assam Meghalaya, NE NMMT,

Day5: Arunachal Pradesh, Assam Meghalaya, NE NMMT, Kerala,

*****>16cm over eastern Assam and Arunachal Pradesh**

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

1. Synoptic Systems:

The analysis based on 00 UTC indicates a cyclonic circulation in lower troposphere (925 hPa) over south Pakistan and adjoining southwest Rajasthan. The forecast shows it will move North-eastward till day2 and becomes less marked thereafter. The analysis also indicates a cyclonic circulation over North West Uttar Pradesh and adjoining area. The forecast shows it will persist till day2. The analysis shows another cyclonic circulation over East Uttar Pradesh and adjoining Bihar in lower troposphere (925hPa). The forecast shows it will move eastward and lies over north Bihar and adjoining areas on day3. The analysis shows a cyclonic circulation over southern parts of West Madhya Pradesh it will become less marked in next 24 hour forecast. Another cyclonic circulation is seen in the analysis over Gujarat. The Analysis also indicates a trough extends from south Madhya Maharashtra across south interior Karnataka north Kerala and north interior Tamil Nadu. The forecast shows it will persist till day3.

2. Location of Jet and Jet Core (>60kt) at 500hPa: Although the presence of strong westerlies is found over east and northeast India but no jet core over the Indian region for the next 3 days

3. Low Level Vorticity {850hPa Positive Vorticity ($>12 \times 10^{-1}/s$): Low level Positive Vorticity is seen mostly over the cyclonic circulation, along the trough and NE states for next 3 days. It is inferred that some parts of Uttarakhand, West Uttar Pradesh and adjoining areas has Positive Vorticity on day 1.

4. Spatial distribution of T-storm Initiation Index, Lifted Index, Total Total Index, CAPE, CIN and Sweat Index [High potential for thunderstorm]:

T-Storm Initiation Index (> 3): The threshold value of the index > 3 over Punjab, Haryana, Uttar Pradesh, coastal areas of Gangetic West Bengal and Kolkata, parts of Orissa, Bihar, Jharkhand, Andhra Pradesh, Telangana, Rayalaseema, Kerala, Karnataka, Tamil Nadu, parts of Gujarat, Rajasthan, coastal Maharashtra including Mumbai, Konkan & Goa, Vidarbha adjoining Chhattisgarh, coastal areas along the east coast and west coast, extreme south peninsular India, Tripura and adjoining area, SHWB during all 3 days; over some parts of East Uttar Pradesh on day 1; over parts of west Uttar Pradesh, Uttarakhand, Assam and adjoining areas on day 2; over parts of east Madhya Pradesh on day1; over some parts of West Madhya Pradesh on day 2; over most of the parts of Sikkim and NE states on day 3; Maximum value of the index is seen over parts of Gujarat, northern parts of coastal areas along the west coast, Konkan and Goa, coastal Maharashtra, Bihar, Jharkhand, GWB, Orissa on day 1 and 2; over parts of Bihar, Jharkhand, GWB, Orissa, coastal Andhra Pradesh, Assam, Tripura and adjoining areas on day 3.

Lifted Index (< -2): The threshold value of the index is below -2 over parts of J&K, Punjab, Haryana, Delhi, Uttar Pradesh, Uttarakhand, Himachal Pradesh, Gujarat, Saurashtra region, Rajasthan, coastal Andhra Pradesh, coastal Karnataka, Telangana, Rayalaseema, Konkan and Goa, Kerala, Tamil Nadu, southern part of west coast, coastal areas along the east coast, Orissa, Madhya Pradesh, Chhattisgarh, Vidarbha, GWB, Bihar, Jharkhand, Sikkim, Assam, Tripura and adjoining areas on all 3 days; over parts of East Madhya Pradesh region on day 1; maximum negative value of the index less than -8 is seen over parts of coastal Gujarat on day 1; over parts of costal Orissa, Assam, Sikkim, Tripura and adjoining areas on day3.

Total Index (> 50): The threshold value of the index is > 50 over some parts of Gujarat, Madhya Pradesh, west Rajasthan and adjoining north Maharashtra on day 1; over some parts of Rajasthan and Vidarbha on day 2; over parts of Gujarat and south west Rajasthan on day3; maximum value of the index >60 is seen over parts of south west Rajasthan and adjoining Gujarat on day 3.

Sweat Index (> 300): Although the threshold value of the Index >300 is seen in most parts of the country but the maximum value of the index greater than 700 is seen over parts of J&K, western part of Gujarat, Jharkhand on day1; over some of the parts of J&K and Orissa on day2; over

parts Sikkim, Bihar, Jharkhand, Orissa, GWB, SHWB and NE states on day 3; over some parts of GWB, Jharkhand and Orissa and adjoining areas on day 3.

CAPE (> 1000): Mostly in areas of southern peninsular India, along west coast and east coast and coastal areas of GWB, Orissa, Andhra Pradesh, Telangana, Rayalaseema, Kerala, Tamilnadu, Karnataka, Gujarat, coastal Maharashtra, Konkan and Goa, Bihar, Jharkhand, GWB, SHWB during all 3 days; over parts of Punjab and south west Rajasthan on day1; over Parts of Assam, Tripura, Sikkim, SHWB and adjoining areas on day 2; over parts of north west Rajasthan, Assam, Sikkim Tripura and adjoining areas on day 3; Maximum value of the index greater than 2500 is seen mostly over parts of coastal Gujarat on day 1 and 2; over parts of coastal Orissa, GWB, Sikkim, Assam and adjoining areas on day 3.

CIN (50-150): Although the threshold value of the Index lies in the range of (50–150) over most part of the country except during all 3 days but the maximum value of the index > 400 is seen over parts of Punjab on day2.

5. Rainfall Activity:

40-70 mm Rainfall: over parts of Arunachal Pradesh and adjoining areas on day 3.

10-40 mm Rainfall: over parts of J&K, Himachal Pradesh, Uttarakhand, Sikkim, NE states, Foothills of Himalayas, SHWB, Kerala, Karnataka, Tamil Nadu, on all 3 days; Jharkhand, GWB; over parts of Orissa and adjoining Andhra Pradesh on day 1 and 3; over parts of Punjab on day 2.

Up to 10 mm rainfall: Over parts of Sikkim, NE states, Foothills of Himalaya, J&K, Uttarakhand, Punjab, Haryana, Delhi, Himachal Pradesh, Rajasthan, Uttar Pradesh, Bihar, Jharkhand, Orissa, Chhattisgarh, Madhya Pradesh, Vidarbha, Marathwada, Madhya Maharashtra, GWB, SHWB, Andhra Pradesh, Kerala, Karnataka, Tamil Nadu, Telangana and Rayalaseema on all 3 days; over parts of Gujarat on day 1 and 2.

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

1. Model Reflectivity (Max.dBz):> 25 dBZ Model Reflectivity: Over parts of J&K, north west Rajasthan, Punjab, Haryana, Himachal Pradesh, Uttarakhand, Orissa, GWB, SHWB, Telangana, Karnataka, Bihar, Jharkhand, Sikkim, NE states on day 1; over parts of J&K, Punjab, Haryana, Delhi, Uttar Pradesh, Himachal Pradesh, Uttarakhand, Orissa, Assam, Arunachal Pradesh, Meghalaya, Mizoram, Tripura and adjoining areas, some parts of Madhya Pradesh on day 2 and 3; over parts of north west Rajasthan on day 3; maximum value of the Model reflectivity is seen over parts of J&K, Himachal Pradesh, Uttarakhand, SHWB, Sikkim and NE states on day 2 and 3; some parts of J&K on day 1; some parts of north Rajasthan on day 3.

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

Total Index (> 50): Above threshold value is observed over most parts of the country except extreme south peninsular India, southern parts of west coast and the east coast, coastal Andhra Pradesh, Karnataka, NE states, Bihar, Jharkhand, Sikkim, GWB and SHWB during all 3 days; below threshold value is seen over parts of J&K, Punjab, Uttar Pradesh, Uttarakhand, Telangana and Orissa on day 1; over parts of J&K, Punjab, Haryana, Himachal Pradesh, Uttar Pradesh, Uttarakhand on day 2; over some parts of West Uttar Pradesh, Uttarakhand, Telangana and adjoining area on day 3; maximum value of the index is seen over parts of Rajasthan, Madhya Pradesh, Vidarbha, Gujarat, Madhya Maharashtra and Marathwada on all 3 days; over parts of Uttar Pradesh, Haryana, Chhattisgarh on day 2; over parts of Uttar Pradesh and Chhattisgarh on day 3.

K-Index (> 35): Less than threshold value is observed over most of the part of the country during the next 3 days.

CAPE (> 1500): Greater than threshold value over parts of Gujarat, coastal areas of west coast, coastal Maharashtra, Konkan and Goa, coastal areas along the east coast, coastal Orissa, GWB and Kolkata, SHWB, Bihar, Jharkhand, parts of Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Telangana, Rayalaseema, Extreme south peninsular India Tripura and adjoining areas on all 3 days; over parts of Punjab, Vidarbha and Chhattisgarh on day 1; over parts of Punjab, north west Rajasthan, East Uttar Pradesh, east Madhya Pradesh and Chhattisgarh on day 2; over parts of J&K, Punjab, Haryana, Himachal Pradesh, Uttar Pradesh on day 3; Maximum value of the index is seen over the parts of coastal Gujarat,

coastal Kerala, coastal Karnataka adjoining Konkan and Goa on day 1; over parts of GWB adjoining Orissa, south interior Karnataka and Kerala on day 2; over parts of Karnataka Kerala, Konkan and Goa, GWB, Orissa, Assam, Tripura and adjoining area on day 3.

CIN (50-150): Although the threshold value of the Index lies in the range of (50–150) over most part of the country during all 3 days the maximum value of the index > 400 is seen over Rajasthan, Gujarat west Madhya Pradesh, Chhattisgarh, Vidarbha, coastal Maharashtra, Uttar Pradesh, Telangana on day 1; over parts of Rajasthan, Uttar Pradesh, Madhya Pradesh, Vidarbha, Gujarat and north Maharashtra on day 2; on day 3 over parts of Haryana, Rajasthan, Gujarat, Madhya Pradesh, Bihar, Jharkhand, Chhattisgarh, Vidarbha, Orissa and Telangana on day 3.

3. Rainfall and thunderstorm activity:

70- 130 mm Rainfall: over parts of Assam and adjoining areas on day 3.

40-70 mm Rainfall: over parts of J&K, Andhra Pradesh adjoining Telangana, Sikkim, Assam and adjoining areas on day 1; over parts of J&K, Assam, Tripura and adjoining areas on day2; over parts of Sikkim and NE states on day 3.

10- 40 mm Rainfall: over parts of J&K, Himachal Pradesh, Uttarakhand, Foothills of Himalaya, Orissa, GWB, SHWB, Sikkim, NE states, Kerala, Tamil Nadu and Karnataka on all 3 days; over some parts of Andhra Pradesh and adjoining Telangana on day 1; over parts of Haryana adjoining Punjab and Bihar on day 2; over some parts of north west Rajasthan and Orissa on day 3.

Up to10 mm Rainfall: Over parts of J&K, Himachal Pradesh, Uttarakhand, Punjab, Haryana, Delhi, Rajasthan, East and West Uttar Pradesh, foothills of Himalaya, Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Telangana, Rayalaseema, Vidarbha, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, Orissa, GWB, SHWB and NE states on all 3 days; over parts of Gujarat, Madhya Maharashtra, Marathwada on day 1 and 2.

3. IOP ADVISORY FOR 24 and 48Hrs:

Summary and Conclusions:

Day-1 & Day-2:

- The Western Disturbances over Afghanistan & neighbourhood is likely to give thunderstorm with hail over Jammu & Kashmir, Himachal Pradesh, on day 1 and day2. This system together with the cyclonic circulation over northwest Uttar Pradesh and neighbourhood will also give rise to thunderstorm with squall/ gusty winds over Punjab, Haryana and Uttar Pradesh during the same period.
- The WD which is moving away is likely to cause Thunderstorm with gusty winds over Assam & Meghalaya on day 1 and Thundersquall with hail on day 2.
- Another cyclonic circulation is seen lying over East Uttar Pradesh & adjoining Bihar extending upto 0.9 km above mean sea level. Also, the trough in westerlies roughly along Long. 88° E to the north of Lat. 22°N between 3.1 km & 5.8 km above mean sea level and the moisture incursion due to the anticyclone over Bay of Bengal will give rise to thunderstorm with hail over Bihar and thunderstorm with gusty winds over Chhattisgarh, Odisha, Jharkhand, Gangetic West Bengal, Sub-Himalayan West Bengal & Sikkim for two days.
- The other cyclonic circulations over Gujarat Region and over southwest Madhya Pradesh and neighbourhood are likely to cause thunderstorm with squall/ gusty winds over central India also for two days.
- Due to lack of enough moisture and high temperature, convective storms are expected over Rajasthan, which may cause dust storms at isolated places over west Rajasthan.

24 hour Advisory for IOP:

Significant Rainfall:

Nil

Thunderstorm with Squall/Gusty winds:

Kerala, Tamil Nadu, Interior Karnataka, Telangana, Rayalaseema, North Coastal Andhra Pradesh, Chhattisgarh, Vidarbha, Madhya Pradesh, Odisha, Jharkhand, Gangetic West Bengal, Sub-Himalayan West Bengal & Sikkim, Assam & Meghalaya
Punjab, Haryana, East Rajasthan, Uttar Pradesh

Thunderstorm with Squall/Hailstorm:

Jammu & Kashmir, Bihar, Himachal Pradesh,

Thunderstorm/Duststrom:

West Rajasthan

48 hour Advisory for IOP:

Significant Rainfall:

Nil

Thunderstorm with Squall/Gusty winds:

Tamil Nadu, South Interior Karnataka, Telangana, North Coastal Andhra Pradesh, Gangetic West Bengal, Sub-Himalayan West Bengal & Sikkim, Bihar
Nagaland, Manipur, Mizoram & Tripura
Haryana, East Rajasthan, Uttar Pradesh

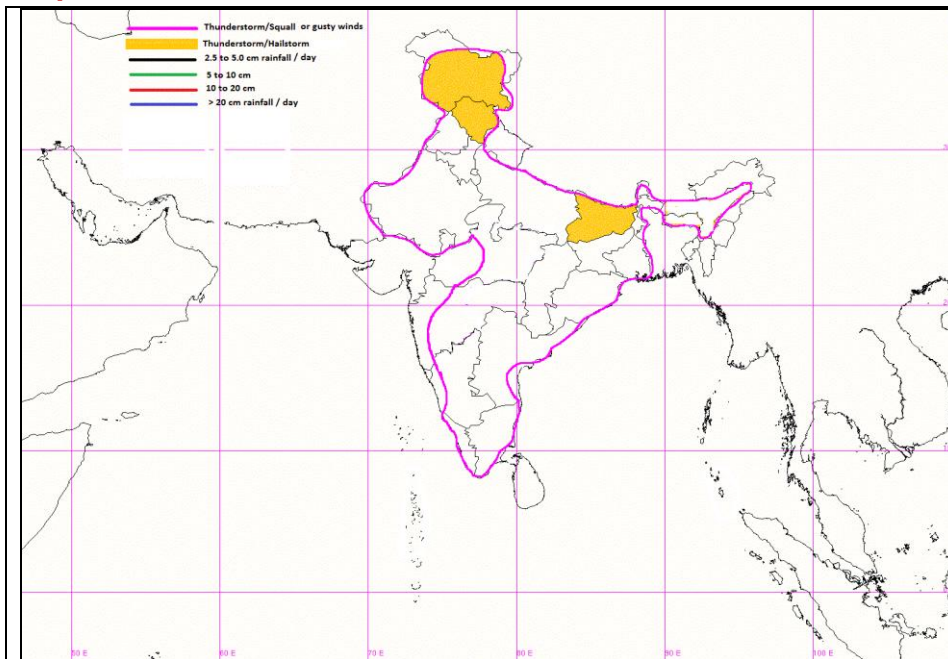
Thunderstorm with Squall/Hailstorm:

Jammu & Kashmir, Punjab, Himachal Pradesh, Uttarakhand, Assam & Meghalaya

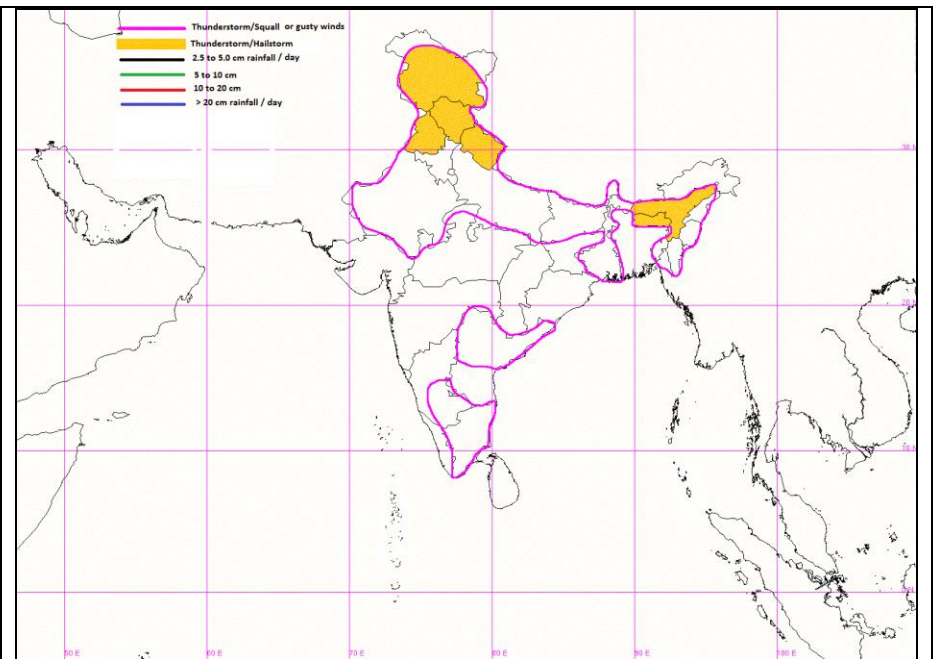
Thunderstorm/Duststrom:

West Rajasthan

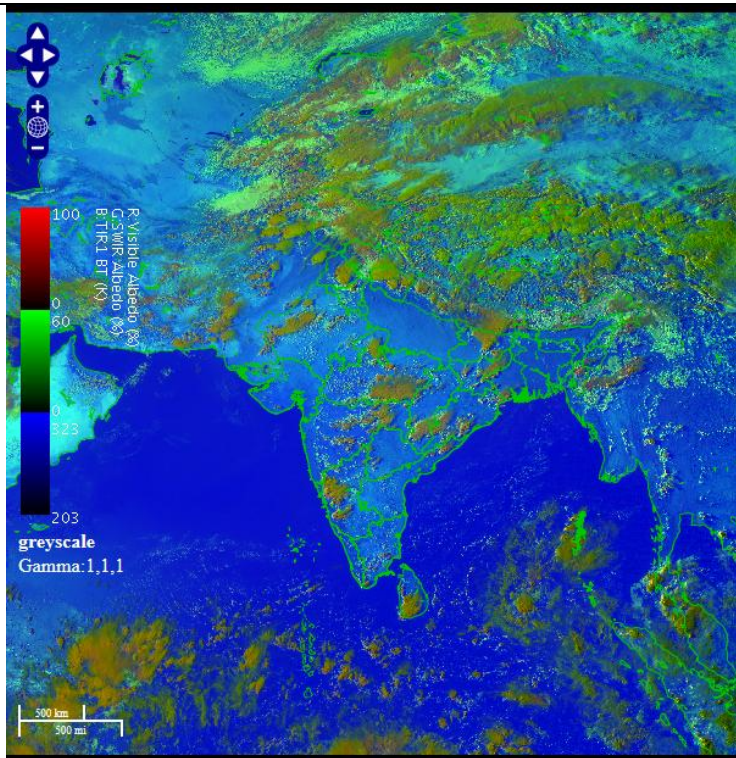
Graphical Presentation of Potential Areas for Severe Weather:



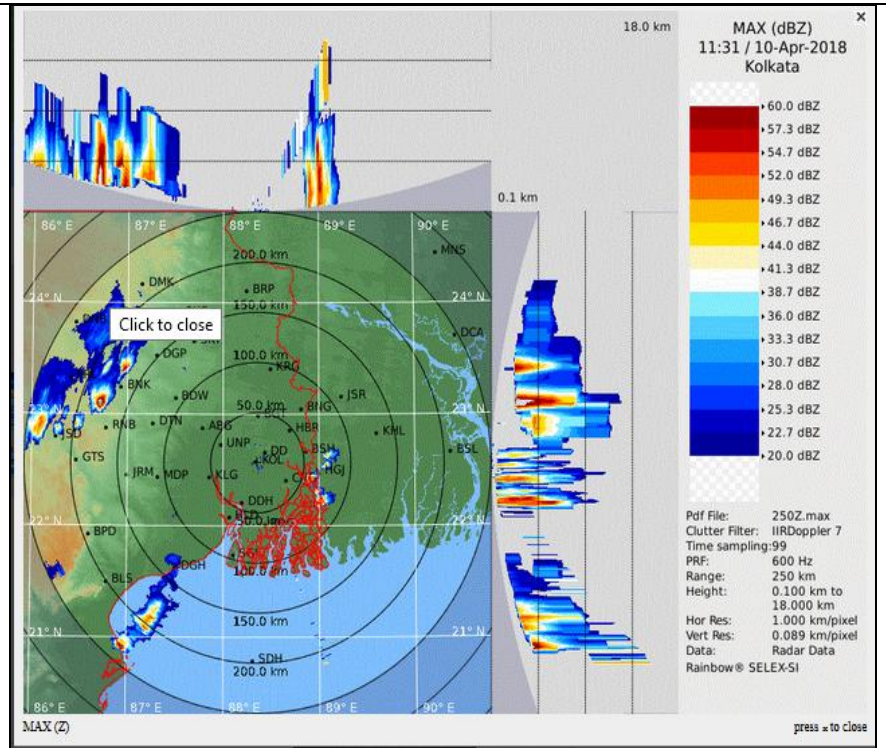
IOP Advisory for 24 hours



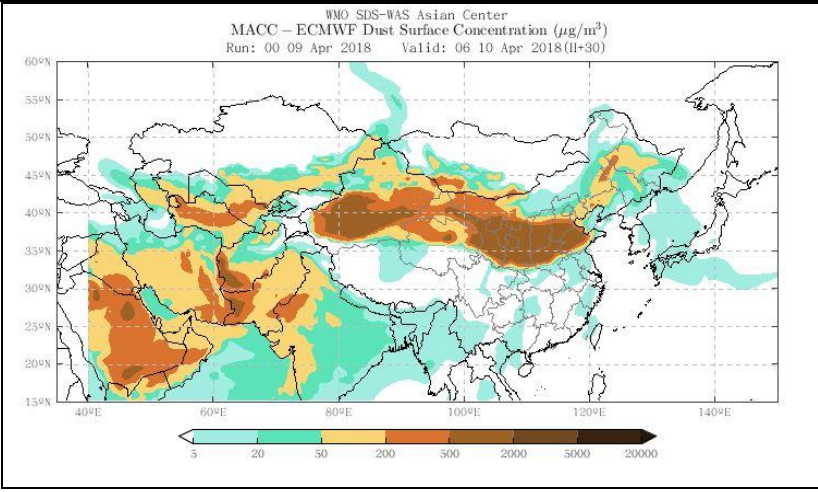
IOP Advisory for 48 hours



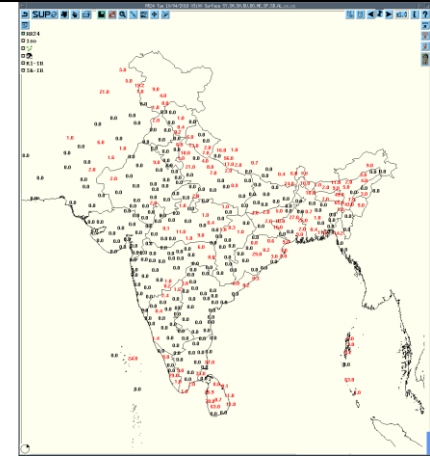
RAPID RGB Imagery at 1600 IST of the Day



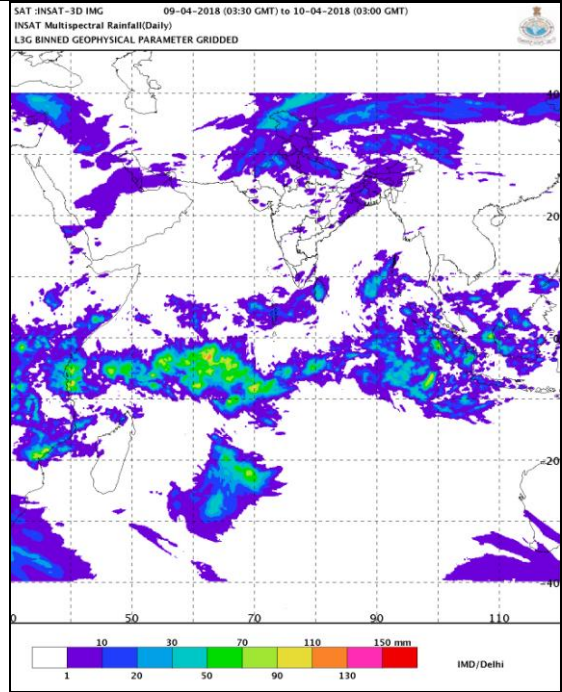
DWR Kolkata at 1701 IST of the Day



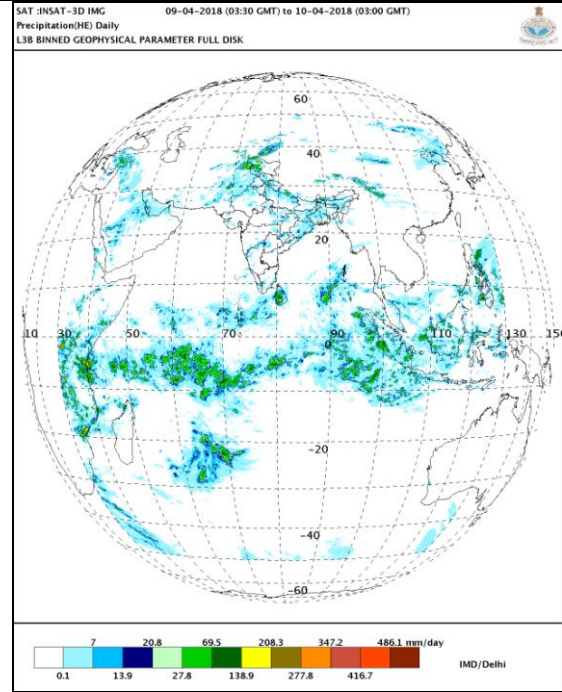
Dust Forecast



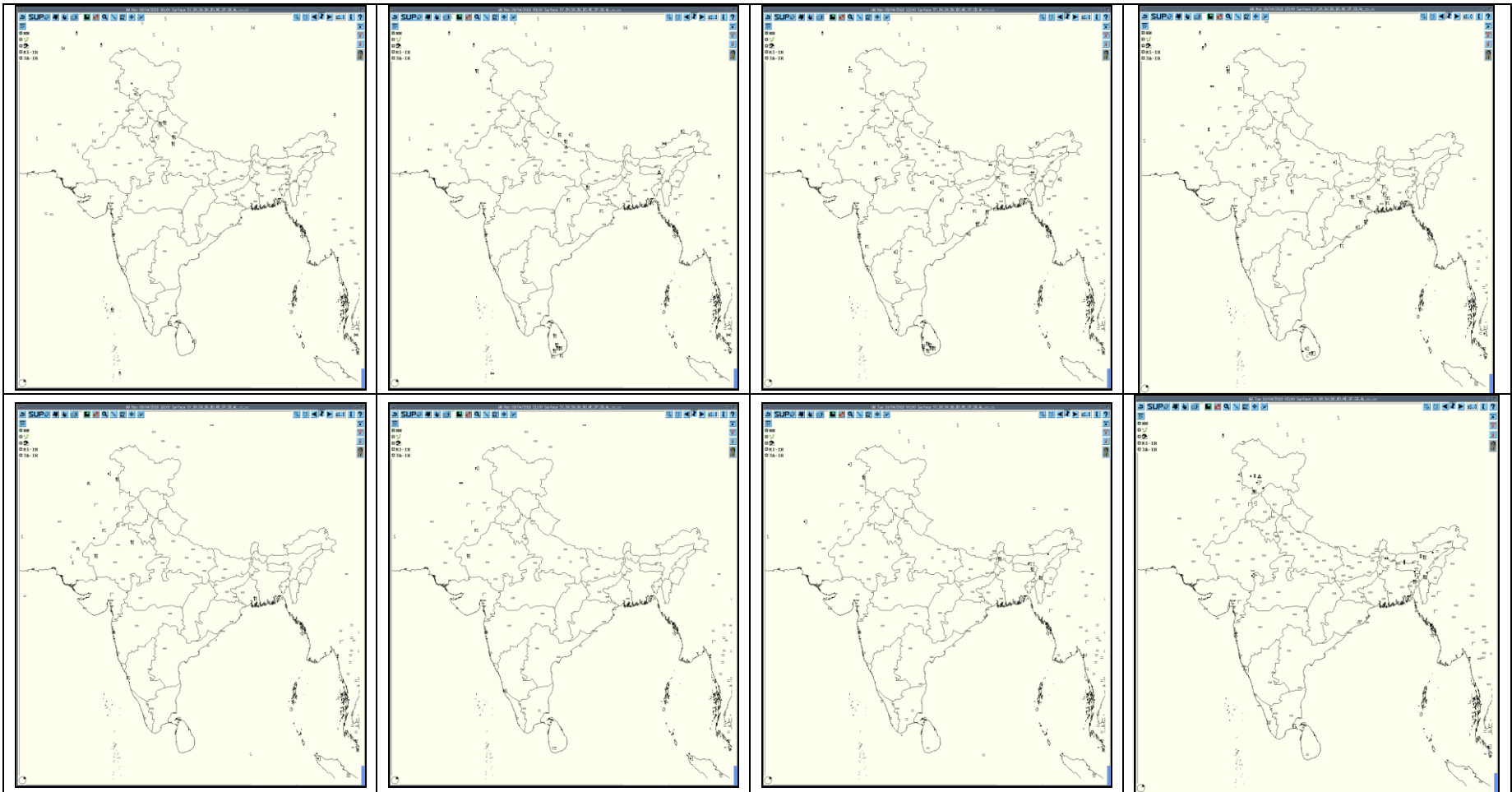
Accumulated 24 Hour rainfall (in red) recorded at 0300UTC of today



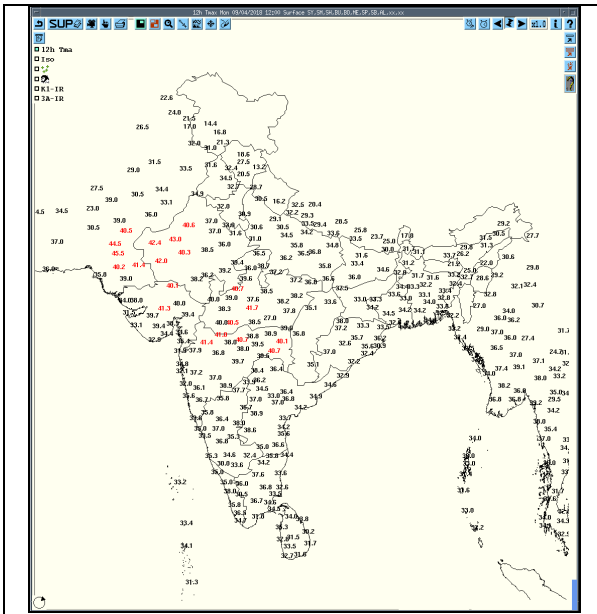
IMR



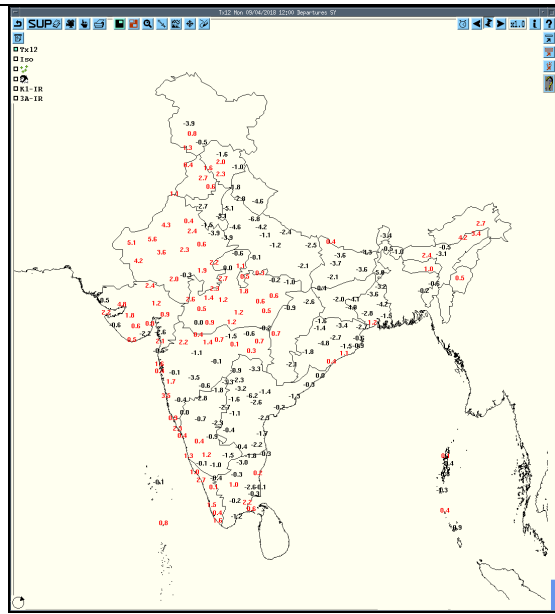
HEM



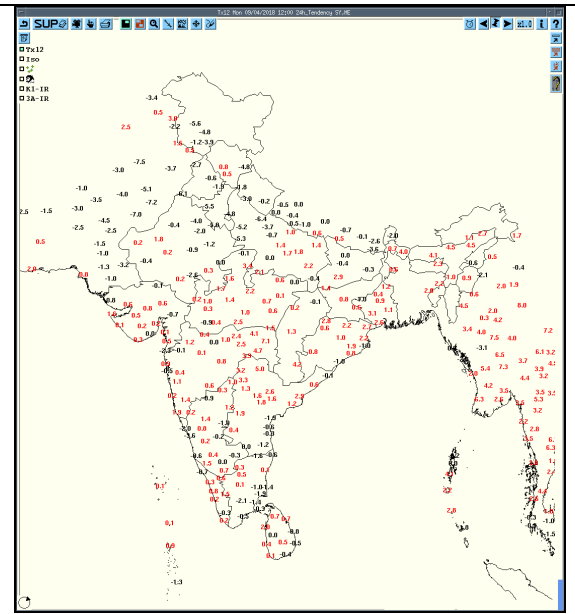
3hourly Past weather at 06, 09, 12, 15, 18, 21 UTC of yesterday and 00 & 03 hrs UTC of today



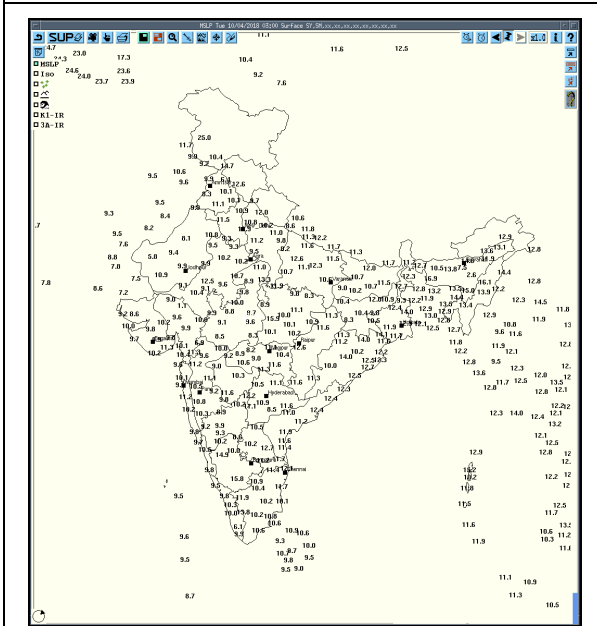
Tmax



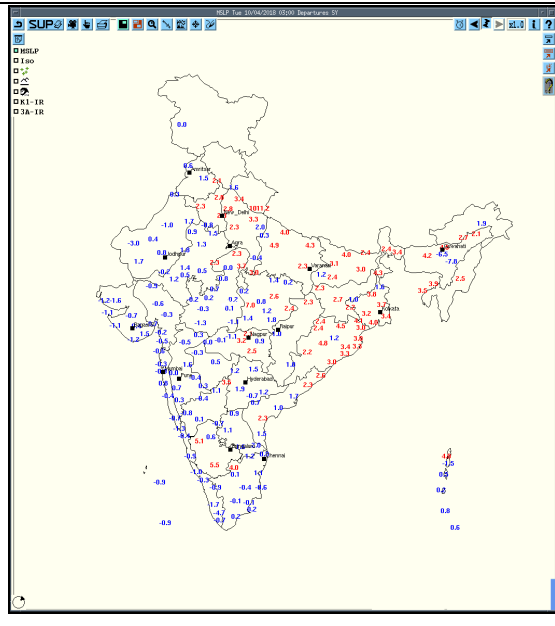
Departure Tmax



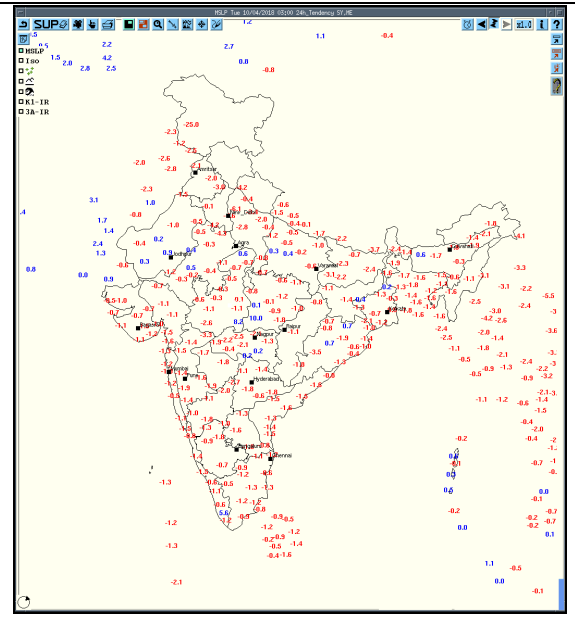
Tendency Tmax



MSLP



Departure MSLP



Tendency MSLP

Past 24 hours DWR Report:

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	10/04/18	090402 UTC TO 090502 UTC	Single cell with average height of 10.0KM (27 dbz echo top) with Maximum Reflectivity of 35 dBZ.	Single cell NW(450KM) moving in NE'ly Direction at speed of 35.0 km/hr.	Single cell converted in to multiple cells at 0502 UTC	TS/DS/SQ	Bareilly, Shambal, Amroha, Rampur, Badaun, Bulandshahar	
		090502 UTC TO 090702 UTC	multiple cell system at 0502UTC with average height of 10KM (32 dbz echo top) with Maximum Reflectivity of 47.0 dBZ	Single Cells chnge in Multiple cell NW 400km moving in south of SE'ly Direction with speed of 40.0 km/h	Multiple cell moving south of SE'ly 07:02 UTC (140 km) NW direction from radar station	TS/DS/SQ	Shahjahanpur, Pilibhit, Furrakhabad, Mainpuri	
		090702 UTC TO 091002 UTC	Multiple cell system at 0702UTC with average height of 11KM (40 dbz echo top) with Maximum Reflectivity of 45.0 dBZ	Multiple cell moving south of SE'ly at 07:02 UTC from station with 50.0 km/hr	Multiple cells converted into a large cells at 07:02 UTC in NW direction at 240 KM from station.	TS/DS/SQ/H S	Lakhimpur Kheri, Kannauj, Sitapur, Hardoi Unnao, Lucknow, Barabanki, Raebareilly	
		091002 UTC TO 091402 UTC	Multiple cell system at 1002UTC with average height of 12KM (47 dbz echo top) with Maximum Reflectivity of 55 dBZ	Multiple cell moving SE'ly at 10:02 UTC from station with 50.0 km/hr	Multiple cell dissipated in few cells at 14:02UTC	TS/DS/SQ/H S	Bahraich, Gonda, Faizabad, Akbarpur Basti, Gorakhpur, Azamgarh, Mau, Deoria, Kushinagar	
		091402 TO 2102	NIL	NIL	NIL	NIL	NIL	NIL
		092102 TO 100202	Single cell with average height of 5.0KM (48 dbz echo top) with Maximum Reflectivity of 55 dBZ.	Single cell develop in multiple cells at 23:02UTC from 250 Km station moving East of SE'ly with 40Km/hr	Multiple cells dissipated at 02:02UTC	TS/SQ	Ghazipur, Azamgarh Mau, Deoria	
		100202 TO 100300	NIL	NIL	NIL	NIL	NIL	NIL

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
Patna	10-04-18	090300-091602	NIL	N/A	N/A	N/A	N/A
		091602-091802	Single Cell Lat-25.70N Long-86.74E Maximum Reflectivity: 44.5 dBZ Echo Top: 12 KM	Range: 167 KM from DWR Patna in ENE direction Movement: Easterly	N/A	THUNDERSTORM	SHARSHA, MADHEPURA, KHAGARIA
		091802-100122	NIL	N/A	N/A	N/A	N/A
		100122-100300	Multiple Cell Lat-26.10N Long-84.17E Maximum Reflectivity: 45 dBZ. Echo Top: 8 KM	Range:108.6 KM from DWR Patna in WNW direction Movement: Easterly	N/A	THUNDERSTORM	SIWAN, BHOJPUR, SARAN,BUXAR
Jaipur	10/04/18	090300 - 100300	Multiple cell with average height of 8.5km & maximum reflectivity 59.0dBZ	Multiple cell develop from 0300 UTC of (continue from previous day) 09/04/2018 towards W, NW, S, SW, E, NE, SE, & N of Jaipur and moved to E, NE, SE Wards at speed 15-20 km/hr.	Multiple cell develop from 0300 UTC of (continue from previous day)09/04/2018 towards W, NW, S, SW, E, NE, SE, & N of Jaipur and reaches maximum reflectivity during 0742 to 1952 UTC of 09/04/18 and continuous at 0300 UTC of 10/04/18.	Thunderstorm with Light rain at a Isolated places	Jaipur, Tonk, Dausa, Ajmer, Nagaur, Karauli, Sawai Madhopur, Sikar, Dholpur, Bharatpur, Kota, Baran, Bundi, Bhilwara, Bikaner, Pali, Chittorgarh, Rajsamand, Churu, Jhunjhunu, Alwar 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
Visakhapatnam	09-04-18	0600UTC	Isolated Cb cells towards S with maximum reflectivity of 53dbz max. height of 7 kms	S (14 Km)	Cb cell formed at 0251 UTC and dissipating started from 0401 UTC	-	Bay of Bengal
		0900UTC	Multiple cells formed from W to NE with maximum reflectivity of 63dbz with max. height of 17 kms	W to N(around 100 to 110 km), NE (220 Km) moving Ely	Multiple cells formed from 0631 UTC, developing and convective well at 0741 UTC onwards	-	Visakhapatnam (AP) Ganjam, Gajapati and Koraput dist. Of Orissa
		1200UTC	Multiple cells towards W,NW and NE with maximum reflectivity of 63dbz with max. height of 18 kms	W (66 to 140 KM) NW(59 TO 133 KM) and NE(187 TO 250 KM) moving Ely	During the period Multiple cells in NE are developing and matured well . W direction cells are matured well and start dissipating from 1131 UTC	-	Visakhapatnam, Srikakulam (AP) Ganjam, Gajapati , Rayaguda and Koraput dist. Of Orissa
		1500UTC	Multiple Cb cells towards N and NE with maximum reflectivity of 60dbz with max. height of 10 kms	N (95 kms) NE(89 KM) moving Ely	During the period Multiple cells in NE are developing and matured well at 1341 UTC and start dissipating from 1431 UTC	NIL	Visakhapatnam, Srikakulam (AP) Ganjam, Gajapati dist. Of Orissa
		1800UTC	Multiple Cb cells towards N and NE with maximum reflectivity of 60 dBZ with max. height of 12 kms	N (50 kms) NE(75 KM) moving Ely	Since last observation Cb cells dissipated at 1631 UTC	Thunder storm with rain	Visakhapatnam

Realised past 24hrs TS/SQ/HS Data:

THUNDERSTORM / SQUALL / HAILSTORM REPORT OF RMC KOLKATA REGION

Sub-Division	State	Name of Station Reporting		THUNDERSTORM (TS)	
				Time of Comm. (IST)	Time of End (IST)
SHWB		JALPAIGURI	42399	0515-0710	
		MALDA	42503	1645-1800	
GWB	West Bengal	ALIPORE	42807	2150-2310	
		DUM DUM	42809	2215-2325	
		CANNING	42812	NIL	
		DIAMOND HARBOUR	42811	NIL	
		HALDIA	42806	NIL	
		DIGHA	42901	NIL	
		ASANSOL	42712	1655-1830	
		BANKURA	42706	1800-2100	
		SRINIKETAN	42708	NIL	
Jharkhand	Jharkhand	RANCHI	42701	1450-1710 1950-2220	
		DALTONGANJ	42587	1345-1445	
		JAMSHEDPUR	42798	1450-1500	
Odisha	Odisha	BHUBANESWAR	42971	1655-1950	
		BALASORE	42895	1550-1950	
		JHARSUGUDA	42886	NIL	
		CHANDBALI	42973	1815-2050	
		GOPALPUR	43049	1140-1145	
		KEONJHARGARH	42891	1400-1515 1630-1800	

Realised TS/HS/SQ during past 24 hours ending at 0300UTC of today(received from RMCs/MCs)						
Name of Station Reporting	Region	State/Sub Division	Weather Event (TS/Hail/Squall)	Date	Time of Commencement (IST)	Time of end (IST)
Tondi	South India	South Tamilnadu	Thunderstorm	09-04-18	1040	1220
Tondi	South India	South Tamilnadu	Thunderstorm	10-04-18	0345 0640 0716	0420 0716 0835
Kalingapatnam	South India	AP	Thunderstorm	09-04-18	1920	2100
Hyderabad	South India	Telangana	Thunderstorm	09-04-18	1745	1915
Visakhapatnam	South India	AP	Thunderstorm	09-04-18	2130	2230
Kalaburgi	South India	North Interior Karnataka	Thunderstorm	09-04-18	1620	1700
Karipur AP	South India	Kerala	Thunderstorm	10-04-18	0142	0300
Kota	Northwest India	East Rajasthan	Thunderstorm	09-04-18	1940	2040
Bhilwara	Northwest India	East Rajasthan	Thunderstorm	09-04-18	1430	1440
Bundi	Northwest India	East Rajasthan	Thunderstorm	09-04-18	1800	1930
Chittorgarh	Northwest India	East Rajasthan	Thunderstorm	09-04-18	1710	2015
Churu	Northwest India	West Rajasthan	Thunderstorm	09/10-04-18	2115	0110
Bikaner	Northwest India	West Rajasthan	Thunderstorm	09-04-18	1610	1750
Nagpur	Central India	Vidarbha	Thunderstorm	09-04-18	1745	1945
Bramhapuri	Central India	Vidarbha	Thunderstorm	09-04-18	2200	2215
Gadchiroli	Central India	Vidarbha	Thunderstorm	09-04-18	2115	2330
Wardha	Central India	Vidarbha	Thunderstorm	09-04-18	1855	1945
Yeotmal	Central India	Vidarbha	Thunderstorm	09-04-18	1730	2200
Sagar	Central India	Madhya Pradesh	Thunderstorm	09-04-18	1630	2100
Chhindwada	Central India	Madhya Pradesh	Thunderstorm	09-04-18	1500	1630
Ambikapur	Central India	Chhattisgarh	Thunderstorm	09-04-18	1815	1845
Bilaspur	Central India	Chhattisgarh	Thunderstorm	09-04-18	1640	1800
Jammu	Northwest India	Jammu & Kashmir	Thunderstorm	10-04-18	0740	0830
Banihal	Northwest India	Jammu & Kashmir	Thunderstorm	10-04-18	0845	900
Batote	Northwest India	Jammu & Kashmir	Thunderstorm	10-04-18	0830 1045 1640 0355 0535	0930 1055 1650 0435 0726
Katra	Northwest India	Jammu & Kashmir	Thunderstorm	10-04-18	0500	0640

IMPORTANT LINKS:

For NCMRWF NWP products:(<http://www.ncmrwf.gov.in/HomePage/NEPS-prod-1.php>)

For IMD NWP products:(http://nwp.imd.gov.in/diagpro_new.php)

For Synoptic plotted data and charts

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

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

For RANDHRA PRADESHID tool:

http://rAndhra_Pradeshid.imd.gov.in/

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

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

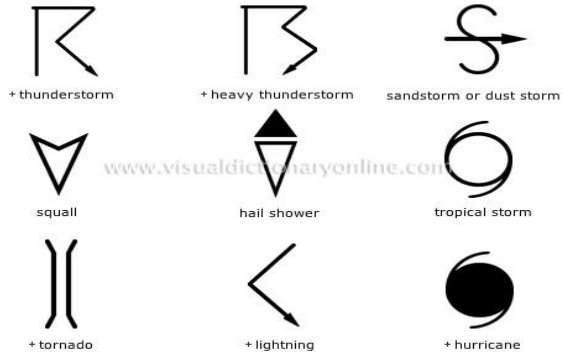
ForRadarimagesofthepast24hoursincludingmosaicofimages:

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

Satellite sounder based T- Phigram

http://satellite.imd.gov.in/mAndhra_Pradesh_skm2.html

WEATHER SYMBOLS:



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