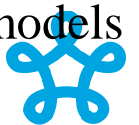


IMD updates since CGMS-51 and report on the medium to long-term future plans

(Dr. R. K Giri)
Satellite Division,
India Meteorological Department

Executive Summary

- Dedicated Earth Station for the reception of INSAT-3D, 3DR & 3DS (launched recently 17 Feb-2024 and in IOT phase). Current Multi-mission Data Reception and Processing System (MMDRPS) at IMD is an latest state of art system.
- A set of Imager /Sounder products are generated operationally like, Net radiation, Improved INSAT Multispectral Rainfall, Land Surface Albedo, Short Wave Radiation over Ocean, Total Precipitable Water over Ocean, Potential Evapo-transpiration over land, Actual Evapotranspiration and from sounder Cloud Top Pressure, Effective Emissivity, Cloud Top Temperature etc.
- RAPID Scan (~ 5 minute) strategy successfully conducted for monitoring the cyclonic activities and can be operated for any Intensive Observational Period with joint consultation of IMD & ISRO.
- Dissemination of INSAT 3D/3DR in Bufr format through Global Telecommunication system (GTS) network for international agencies in real time basis and soon INSAT 3DS data will also be available.
- Ku Band Scatterometer of Oceansat-3 data and products have been used and assimilated in NWP models for operational forecasting especially during Cyclone time.



Cont.....

- The real time reception of scatterometer data is available (12 & 25 km resolutions) at IMD through National remote Sensing Centre, Hyderabad.
- IMD processing daily IPWV (every 15 minute) from GNSS Network of 25 stations and will further enhance 49 more stations of Survey of India. The network will be further enhanced after an MoU with SOI and CORS stations data (more than 100) will also be added. The station-wise IPWV data is available in public domain hourly basis.
- Recalibration of Past historic INSAT data for climatology perspective is in progress jointly with IMD & ISRO.
- Domain specific ($10^{\circ}\text{S}/10^{\circ}\text{N}$ and $64^{\circ}\text{E}/84^{\circ}\text{E}$) Inter-calibration with past INSAT & NOAA data for International Satellite Cloud Climatology Project (ISCCP) is ongoing.
- Regular Joint campaign activity of IMD & ISRO for VIS/SWIR channels is continuing at Great Rann of Kutchh (GROK) area Gujrat.
- New real time analysis of product and information system Rapid (V-2.0) is available in public domain for INSAT data analysis with additional capabilities.



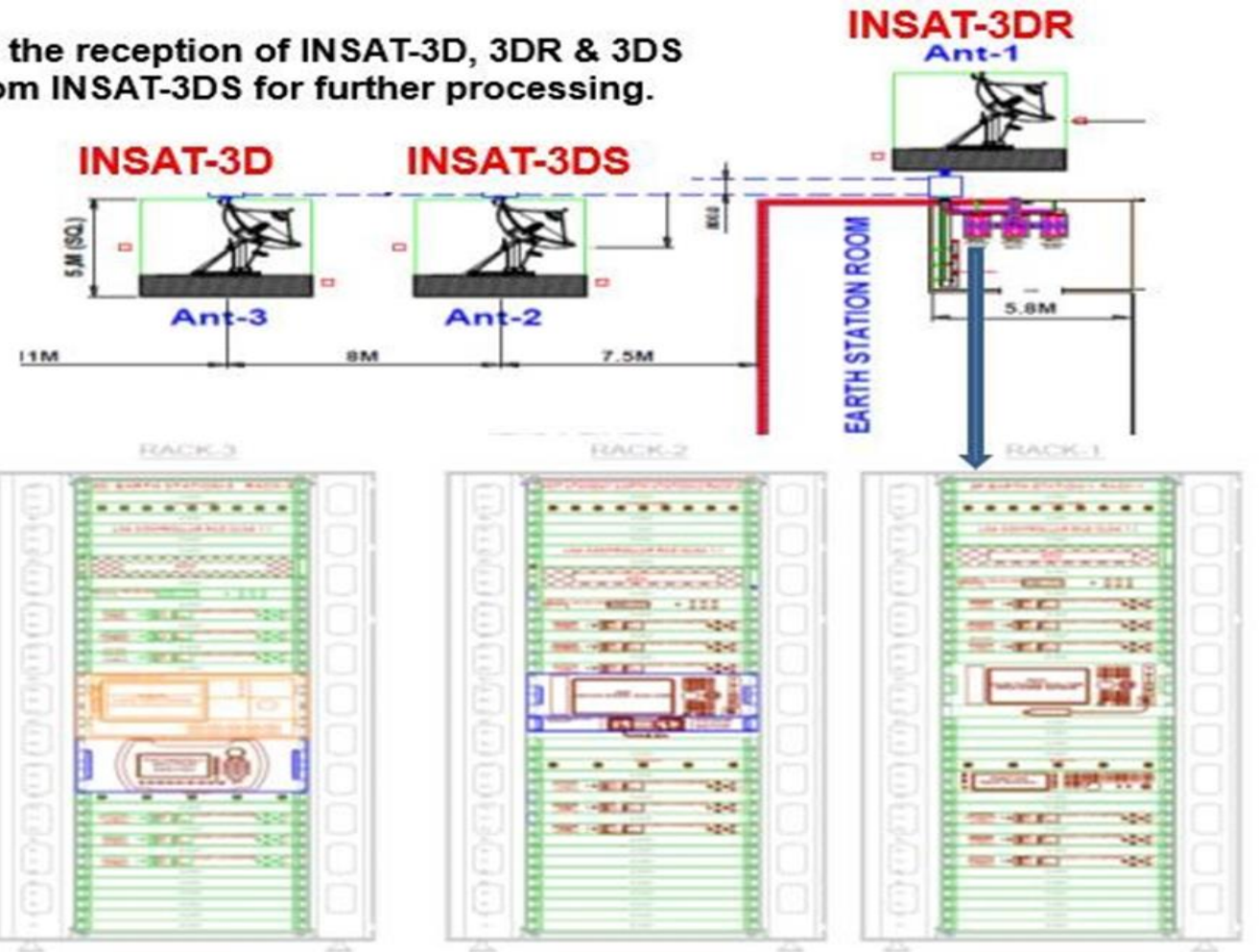
- We are thankful to the EUMETSAT for providing Meteosat-8 services over the Indian Ocean (IODC) through terrestrial link and enhancing the cooperation with EU in future development of GEO+LEO blended products, Nowcasting tool in collaboration with Nowcasting Satellite Application Facility (NWC-SAF) and CAL/VAL activities
- IMD is transferring seamless data of INSAT-3D/3DR & 3DS (in future) to Hong Kong Observatory has been established for the regional SIGMET Coordination platform.
- INSAT (3D,3DR and now 3DS) data and products validation is a regular and joint activity of IMD & ISRO and updated on IMD website.
- IMD is hosting AOMSUC-14 events at New Delhi India during 02-07 December-2024. 1st announcement of this event is already issued in public domain
- Efforts are continue to generate more domain as well as user specific data products in future.
- The joint development (IMD & ISRO) data supply and analysis platform is in progress and will be completed soon and the users world-wide can utilize and analyzed the INSAT PAST and Present data for Research and Development purposes.

Earth Station has three dedicated antenna for the reception of INSAT-3D, 3DR & 3DS satellite signals & ready to receive signal from INSAT-3DS for further processing.

Earth Station has three dedicated antenna for the reception of INSAT-3D, 3DR & 3DS satellite signals & ready to receive signal from INSAT-3DS for further processing.



MMDRPS



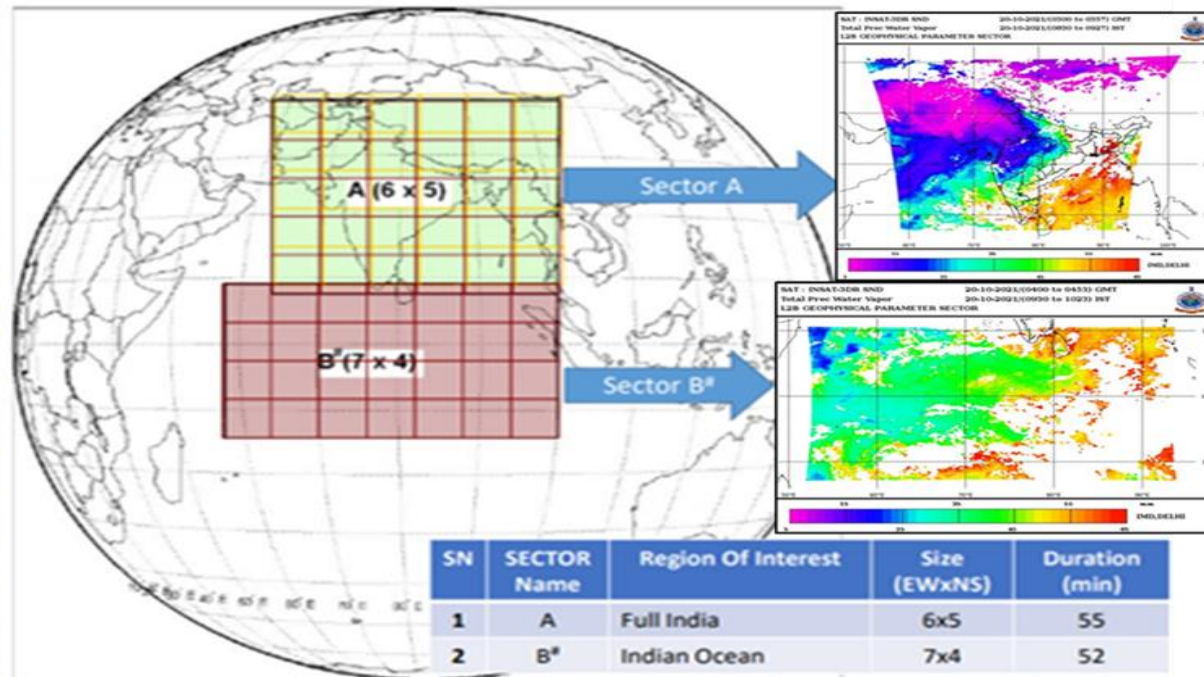
Operational Scenario of INSAT 3D /3DR and 3DS will be updated soon

INSAT Series

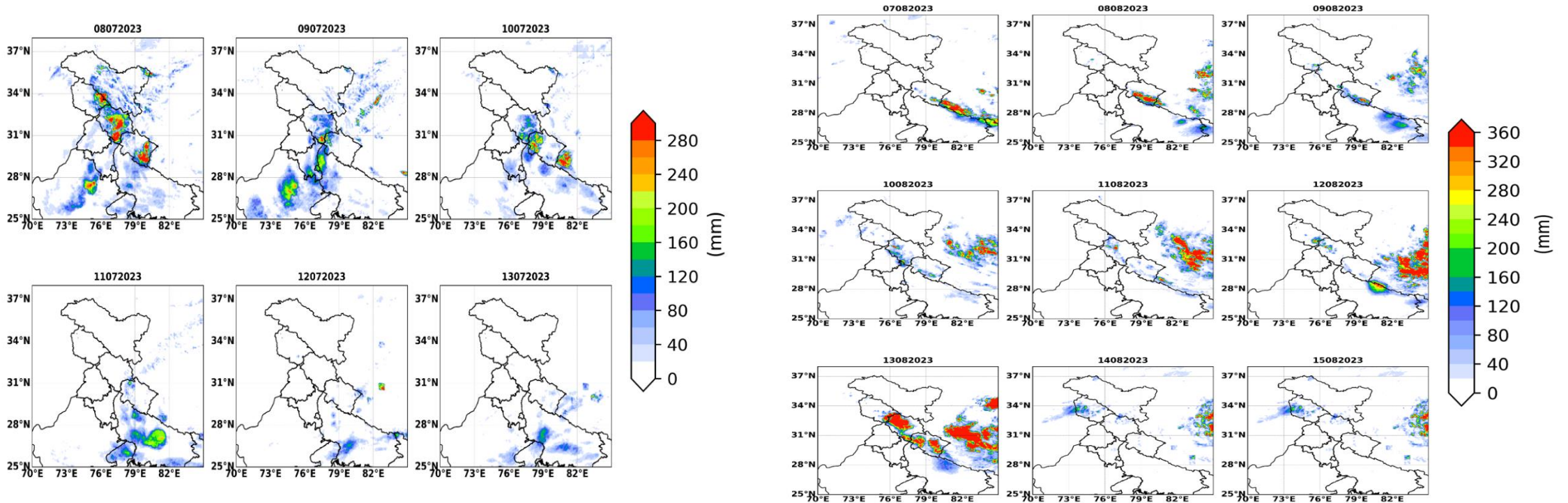
Temporal Resolution

3D -Imager (6 Channel)	½ hourly (xx00 & xx30 UTC)
3D -Sounder (19 Channel)	Reached end of life in September 2020.
3DR -Imager (6 Channel)	½ hourly (xx15 & xx45 UTC)
3DR -Sounder (19 Channel)	Hourly (20 times Region-A & 4 times Region-B) since October 2020

UTC	Sector
00:00	Sector-A
01:00	Sector-A
02:00	Sector-A
03:00	Sector-A
04:00	Sector-B*
05:00	Sector-A
06:00	Sector-A
07:00	Sector-A
08:00	Sector-A
09:00	Sector-A
10:00	Sector-A
11:00	Sector-B*
12:00	Sector-A
13:00	Sector-A
14:00	Sector-A
15:00	Sector-A
16:00	Sector-B*
17:00	Sector-A
18:00	Sector-A
19:00	Sector-A
20:00	Sector-A
21:00	Sector-A
22:00	Sector-A
23:00	Sector-B*

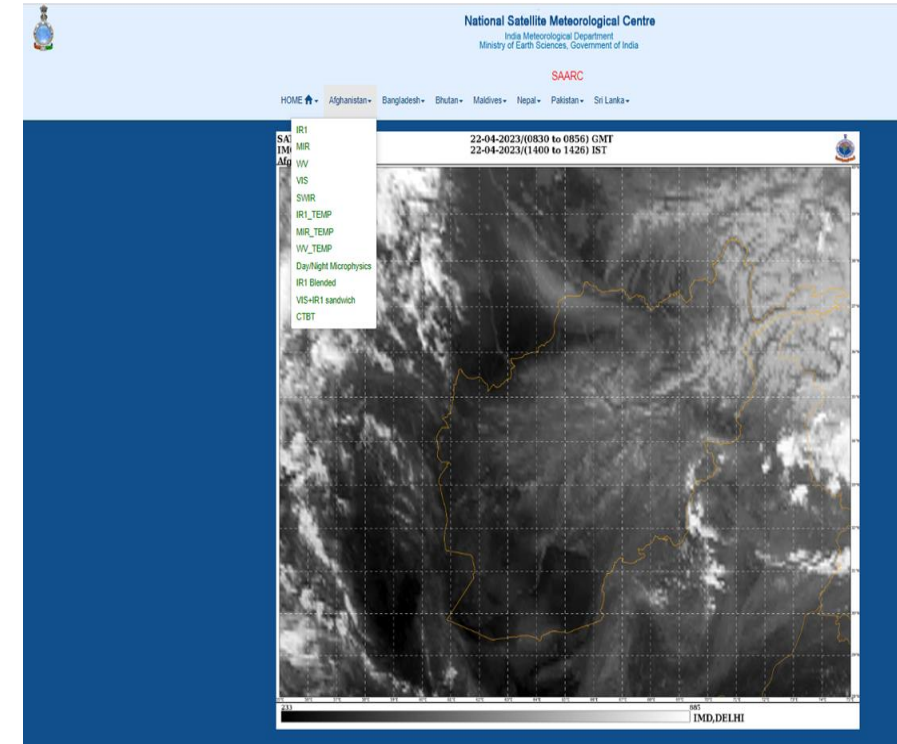
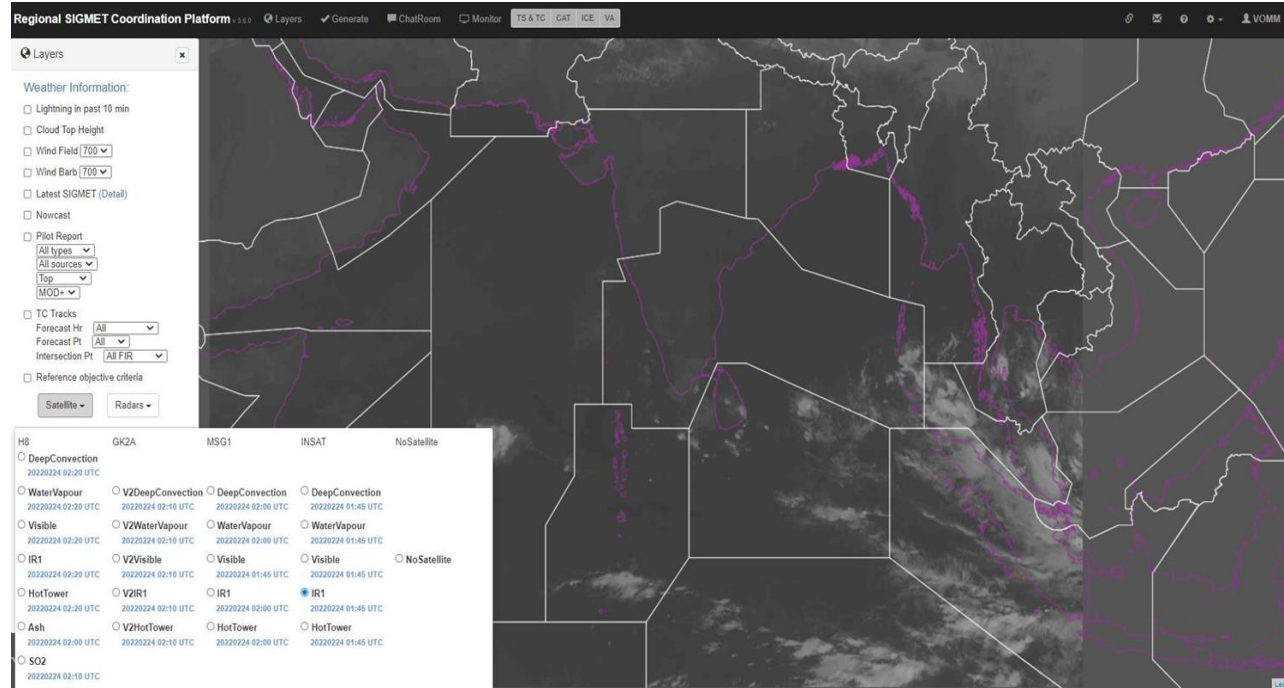


Customized products /data generation as per the requirements



9th July-2023 Heavy Rainfall event at Himachal Pradesh which cause flood like situation Delhi, **INSAT Rainfall** (left) and Uttarakhand on 15 August-2023 which overflow the Ganga river (right panel)

Customized products /data generation as per the requirements



INSAT Data transfer for SIGMET Coordination platform to HKO observatory

SAARC Region

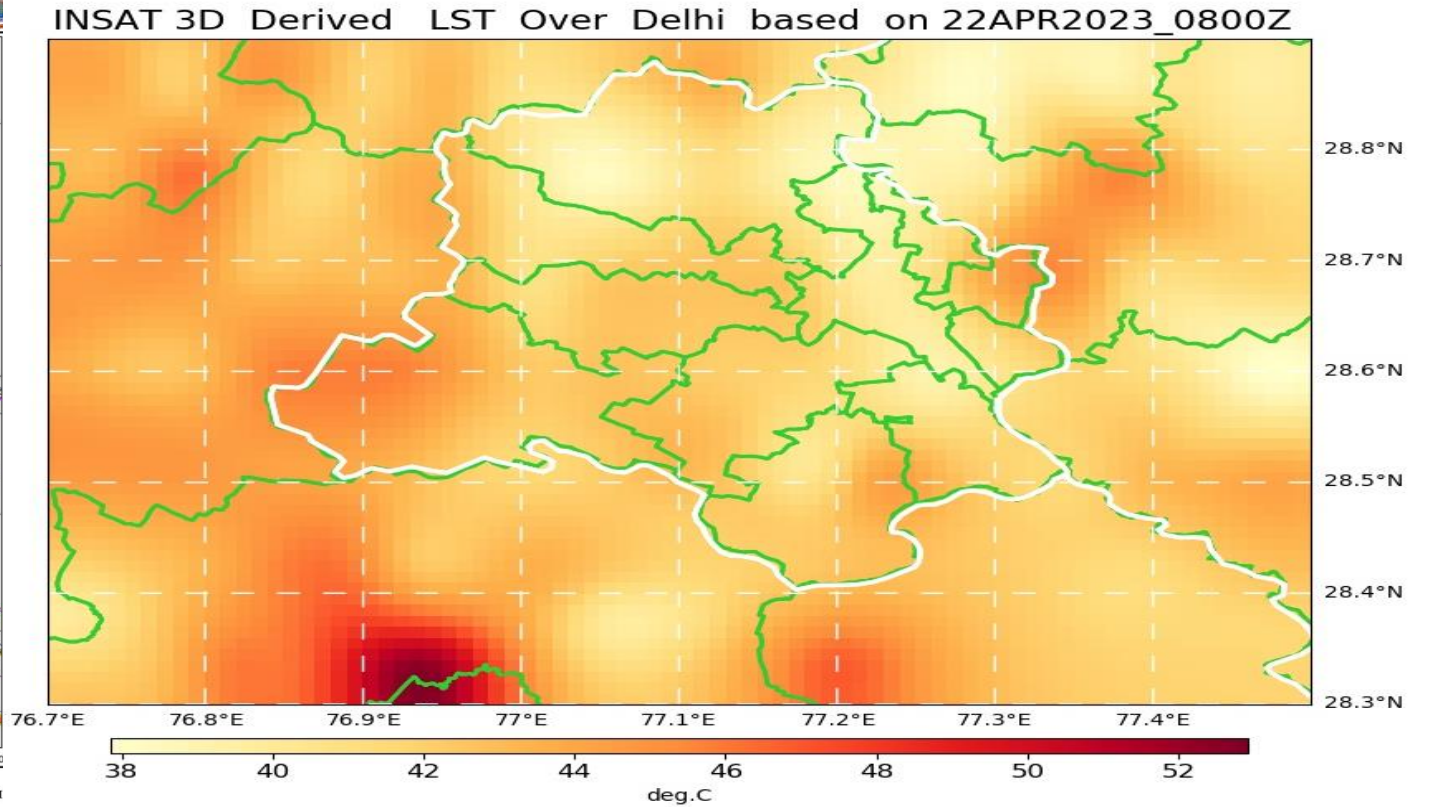
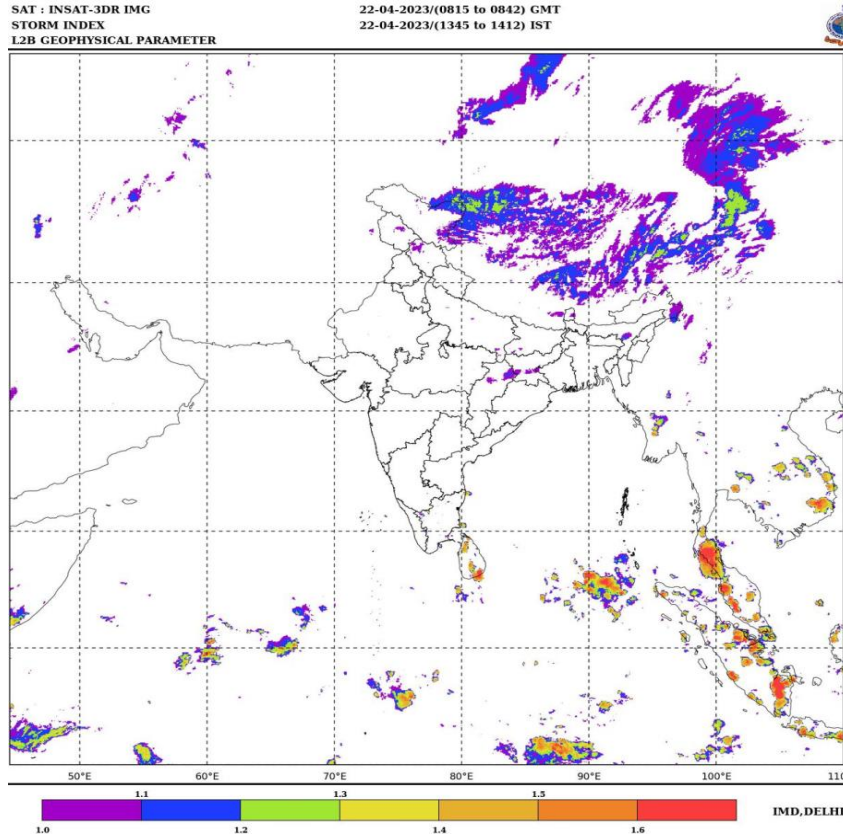
**Coordination Group for
Meteorological Satellites**



CGMS

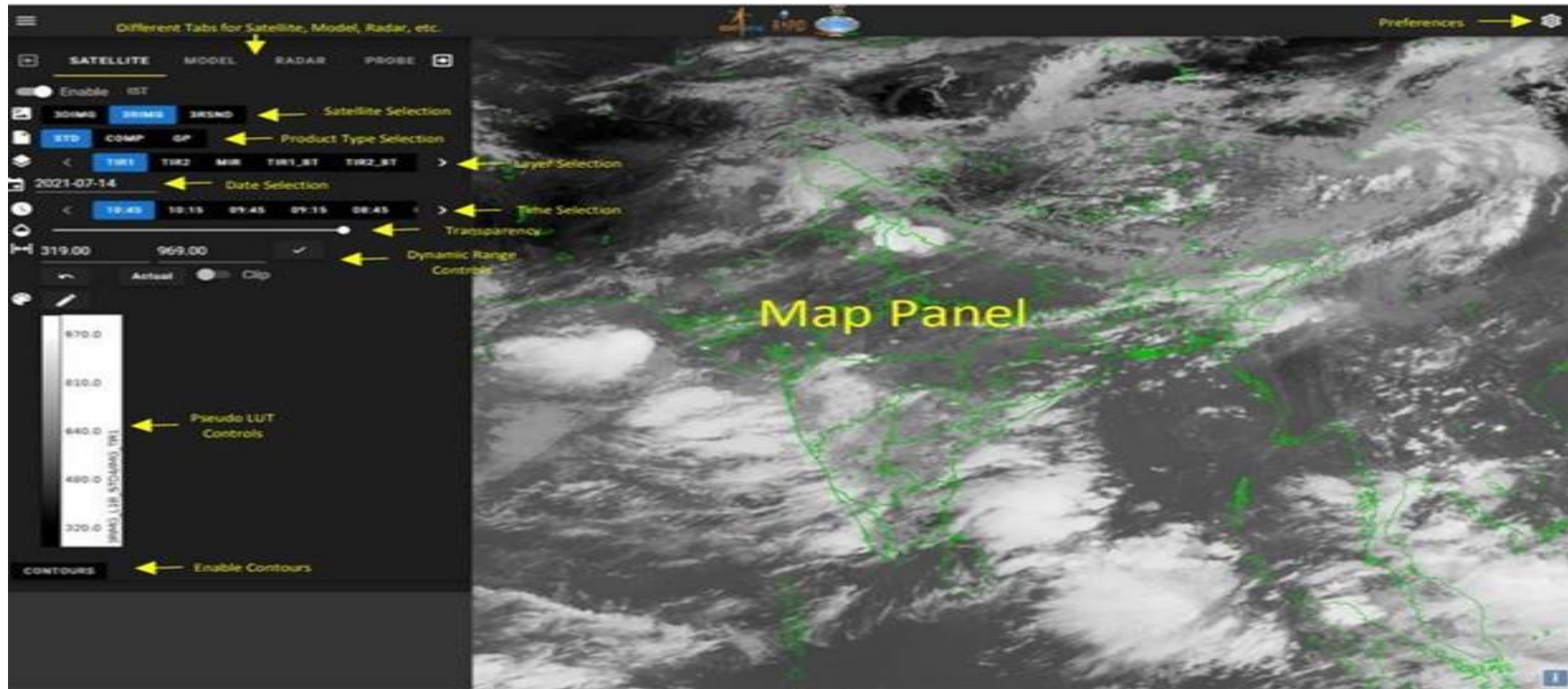
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Customized products /data generation as per the requirements



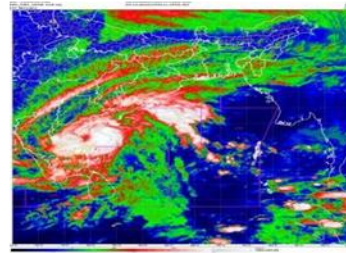
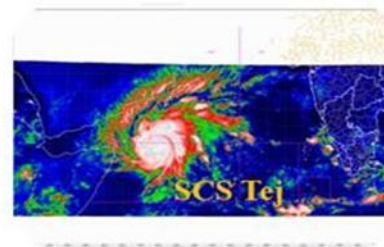
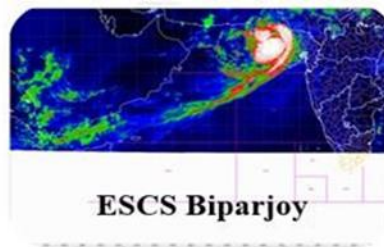
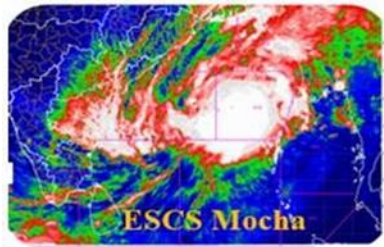
A storm index (left panel) derived experimentally at every 15 minutes by integrating OLR from INSAT-3D/3DR and reflectivity from Precipitation Radar (PR) onboard TRMM. Land surface temperature (LST) product for specific metro cities of India (right panel)

Real time analysis of product and information system (RAPID -V-2.0) with advanced capabilities



RAPID tool (v-2.0) is jointly developed by IMD & ISRO and have advanced features of overlaying and real time processing of Model, Radar, Surface & Upper air observations etc.

Rapid Scan (~ 5.0 Minute duration) utility of INSAT (3/3DR/3DS)



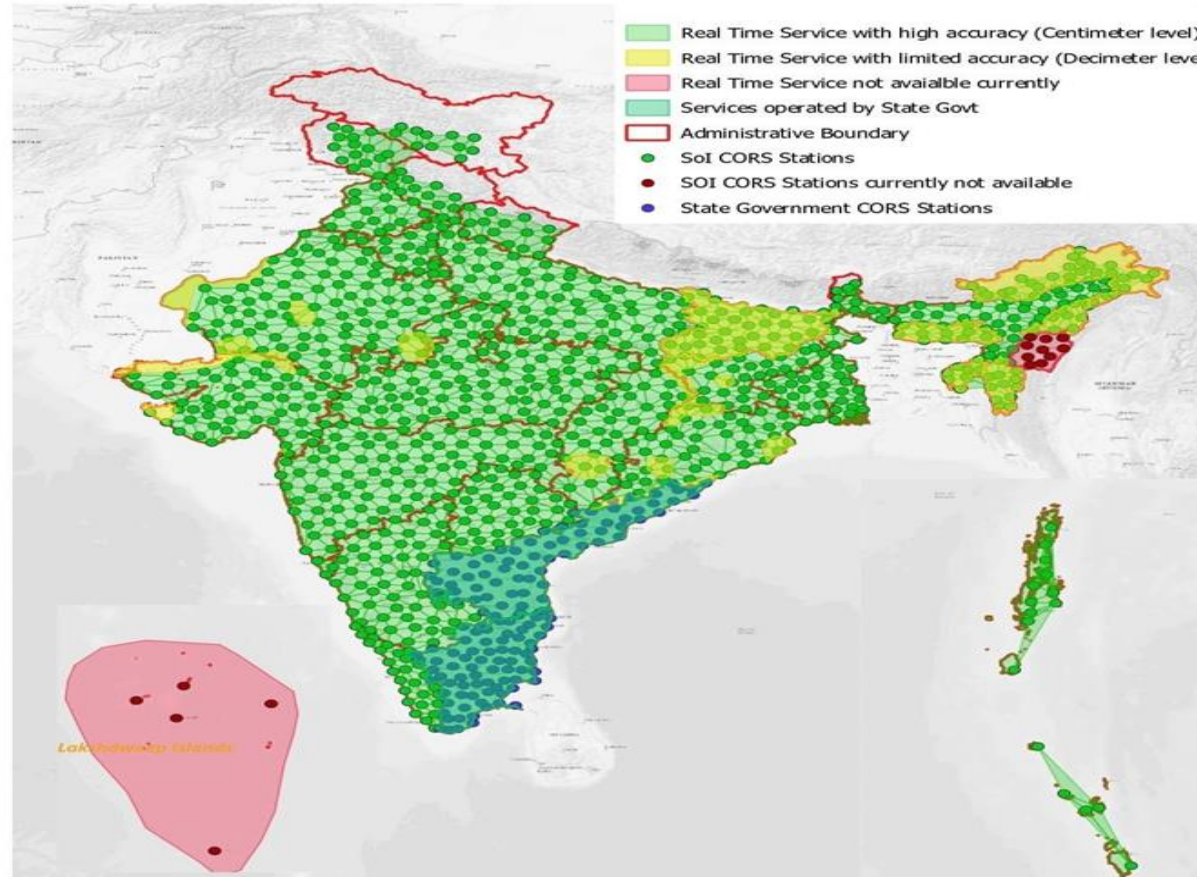
S. No	RAPID SCAN for cyclones	Date
1	ESCS Biparjoy	06-19 th June-2023
2	SCS Tej	20-24 th October-2023
3	VSCS Hamoon	21-25 th October-2023
4	SCS Michaung	01-06 th December-2023

Rapid scan utility of INSAT utilized by the forecaster to see the different type of changes at different stages of the tropical cyclones



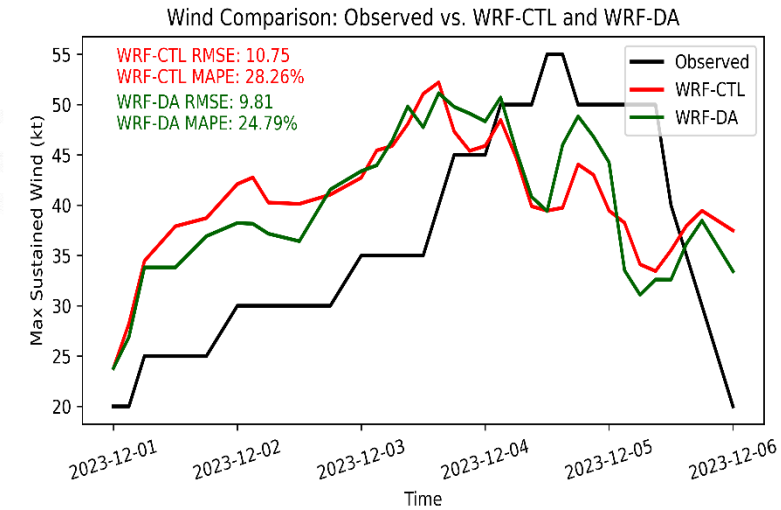
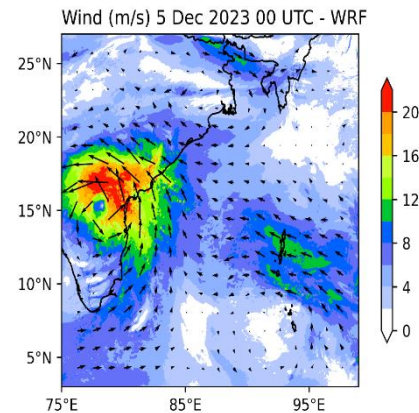
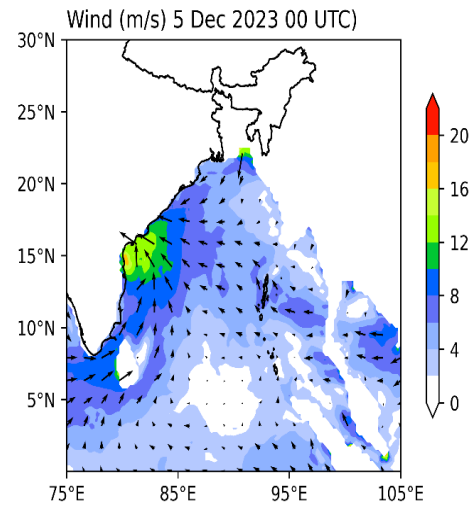
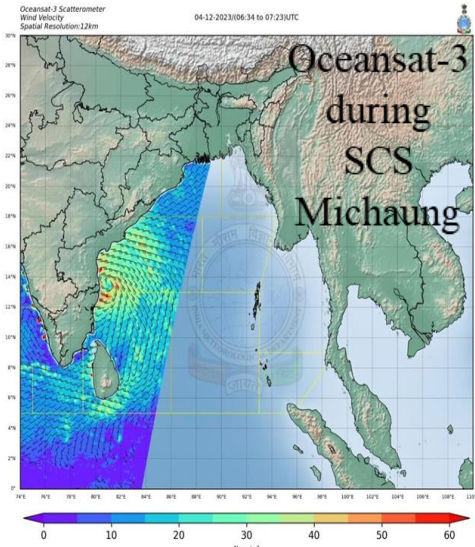
GNSS IPWV Network of IMD (future scenario)

Real Time Positioning Services by SOI CORS Network



IMD GNSS Network including SOI and CORS stations for generating IPWV

Oceansat-3 data and products utilization and assimilation in NWP models



Oceansat-3 products (left 2 figs) and its assimilation in WRF (right 2 figs) on 5th December-2023. The assimilation products shows slight improvement. This data is very useful for forecasting and there is a need to flown more such instruments in the future missions. Currently we have at Oceansat -3 and Metop (A& B)

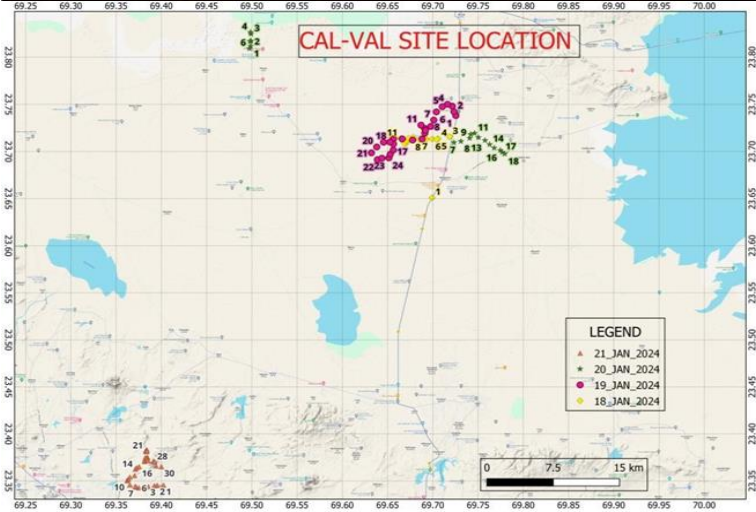
CA/VAL Activities of IMD & ISRO

18-21-January-2024



It is a regular activity for the VIS/SWIR channels calibration /validation at the Great Rann of Kutchh (GROK) site Gujrat-India. The measurements include:

- Surface reflectance using ASD Spectro-radiometer.
- Aerosol, Ozone and water vapour using MicroTops-II
- Sun-photometer and Ozonometer.
- For CAL/VAL campaign, Radiosonde observations were launched on 18th to 21st January at 06 UTC from which vertical profiles of the temperature and humidity including wind observation were obtained.
- Surface observations like dry bulb temperature, Dew point Temperature, wind speed etc. were also taken through surface observatories.



Cal-Val Campaign (IMD & ISRO)

AOMSUC-14 will be hosted by India Meteorological Department (IMD), New Delhi during 02-07 December-2024



14th Asia-Oceania Meteorological Satellite Users' Conference
02-07 December 2024, New Delhi, India

Home	1st Announcement	2nd Announcement	
General Information	Schedule	Summary	Gallery

Host India Meteorological Department (IMD)
Co-sponsors Australian Bureau of Meteorology (AuBoM) Agency for Meteorology, Climatology and Geophysics of the Republic of Indonesia (BMKG) China Meteorological Administration (CMA) India Meteorological Department (IMD) Japan Meteorological Agency (JMA)
Korea Meteorological Administration (KMA) Russian Federal Service for Hydrometeorology and Environmental Monitoring (ROSHYDROMET) World Meteorological Organization (WMO) Group on Earth Observations (GEO)
Contact National Meteorological Satellite Center India Meteorological Department (IMD) Mausam Bhawan, Lodhi Road New Delhi-110003 E-mail: aomsuc14imd@gmail.com

First announcement of the event is already done.

Schedule

2-3rd December 2024

Comprehensive training event on satellite data and product utilization in New Delhi

4-6th December 2024

The AOMSUC-14 plenary and scientific sessions in New Delhi

07th December 2024

Joint Meeting of RA II WIGOS Project and RA V TT-SU for RA II and RA V NMHSs (by invitation) in New Delhi

Call for papers

The participants who wish to present at the conference are invited to register. The online registration and further information about the participating institutions will be available at <http://nmsc.imd.gov.in/aomsuc/index.html>

Registration and Abstract Submission

The registration form (MS Word) and abstract submission including author information, title, and abstract can be e-mailed to the Local Organizing Committee of IMD at aomsuc14imd@gmail.com

The conference will be held in English. Abstracts should be no longer than one page (A4).

Multiple authors are kindly asked to coordinate a single response. To register more than one author, fill out and submit a form for each.

Deadline for abstract submission: 27th September 2024

Please forward this announcement to all your colleagues to keep the dates aside for participating and continue your great tradition to contribute to our AOMSUC community.

Second Announcement

The second announcement will be posted on the website around October 2024. The preliminary program, information for pre-registration which will be requested for all attendees etc. will be provided with the second announcement.

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Thanks for the team of AOMSUC, WMO and IMD officials and expecting due cooperation and support of all the fellow members & colleagues to make the event grand success

Coordination Group for Meteorological Satellites

Key issues of relevance to CGMS: Future Scenario

- Availability of continuity of the data over data sparse regions like oceans
- FCDR generation from past /present INSAT data in accordance with the compatibility WMO database.
- Utilization of latest tools and techniques like AI/ML or virtual machines to develop interactive web based DSS for weather forecasting applications using satellite data.
- Hyper spectral imaging equipped with advanced Lightning Image Mapper etc.

Websites

<http://nmsc.imd.gov.in/aomsuc/index.html>

<https://rapid.imd.gov.in/r2v/>

<https://mausam.imd.gov.in/responsive/satellite.php>

THANK YOU