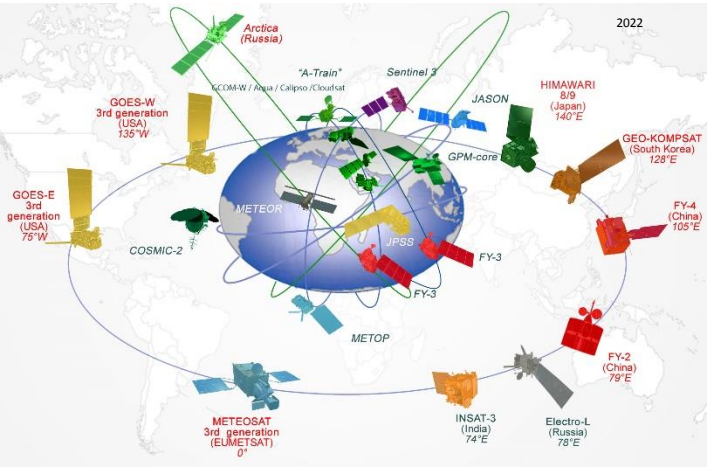


ISRO Report on Highlights and Issues in Datasets and Products

Presented to CGMS-50 WG-II Session, Agenda 2

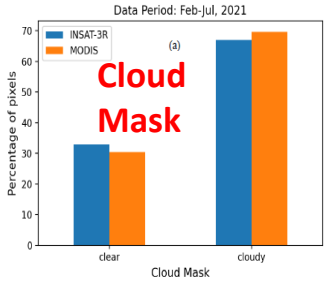
Coordination Group for Meteorological Satellites

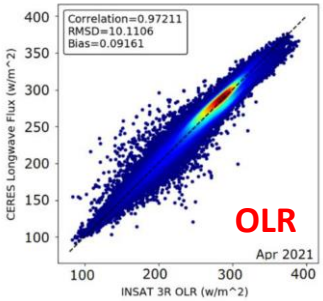
Executive summary

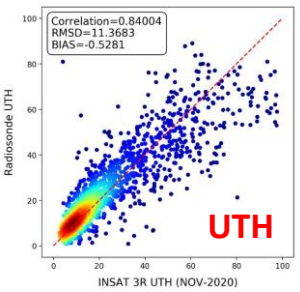
- Joint ISRO-IMD Team validated products in Multi-Mission Data Reception and Processing System (MMDRPS) which is operational at IMD, since Jan 2021 for INSAT-3D/3DR.
- SCATSAT-1 with Ku-band Scatterometer completed the mission in February, 2021.
- ISRO-CNES joint mission SARAL/AltiKa is functioning in mispointing mode and the mission is extended till December 2022 provided the health of the satellite is satisfactory. The mission will be further reviewed in December 2022.
- ISRO-CNES joint mission MeghaTropiques was launched into orbit in October 2011. Madras payload was switched off in May 2013. SAPHIR and ScaRaB has provided useful data for more than a decade. Due to an onboard anomaly in March 2019, the data availability has become low. ISRO-CNES JSC decided to announce the end of mission.
- Under GSICS, inter-calibration of IR channels are in demo phase with IASI-A/B and will be shortly extended to IASI-C and CrIS. Ray-Matching method has been developed for inter-calibration of Vis/SWIR channels using MODIS and 6 years (2016-2021) of matchup data for INSAT-3D/3DR VIS/SWIR channels is prepared.
- Oceansat-3 is scheduled for launch this year with Ku-band scatterometer, Sea Surface Temperature Monitor (SSTM), and 13-band Ocean Color Monitor (OCM).
- GISAT-2 is scheduled for launch in March 2023
- INSAT-3DS is scheduled for launch in March 2024.

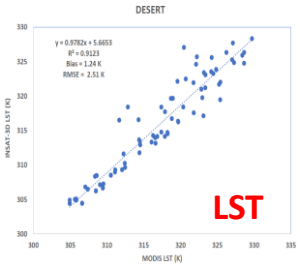
Multi-Mission Meteorological Data Reception and Processing System (MMDRPS)

- A joint ISRO-IMD validation exercise has been carried out to validate products generated in MMDRPS system for INSAT-3D/3DR
- A semi-automated procedure developed and installed in MMDRPS to routinely validate all the products regularly and provide feedback to improve the algorithm.



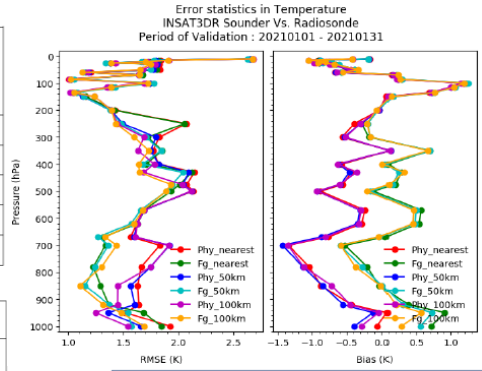


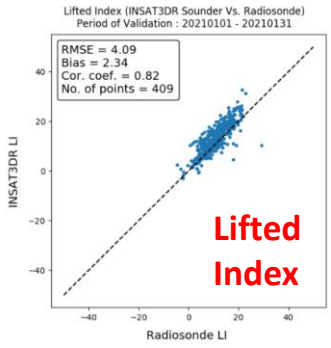




Comparison of INSAT-3D GPI and GPCP Data (Daily) IMSRA				Comparison of INSAT-3DR GPI and GPCP Data (Daily)		
Month	**BIAS**	**RMSD**	**R**	**BIAS**	**RMSD**	**R**
June	-2.40	9.00	0.71	-2.26	9.25	0.70
July	-3.14	9.96	0.71	-4.13	13.55	0.58
August	-2.38	10.06	0.74	-2.13	10.59	0.71
September	-2.96	9.08	0.74	-2.49	9.24	0.72

Table 4: GPI Rainfall statistics for July 2020





HE	INSAT-3DR with IMERG			INSAT-3D with IMERG		
Month	RMSE (mm/hr)	R	Bias	RMSE (mm/hr)	R	Bias
June	4.62	0.46	2.03	5.39	0.41	2.40
July	3.96	0.37	1.48	4.09	0.42	1.82
August	2.67	0.42	1.02	3.85	0.39	1.40
September	3.21	0.37	1.41	5.32	0.41	2.44

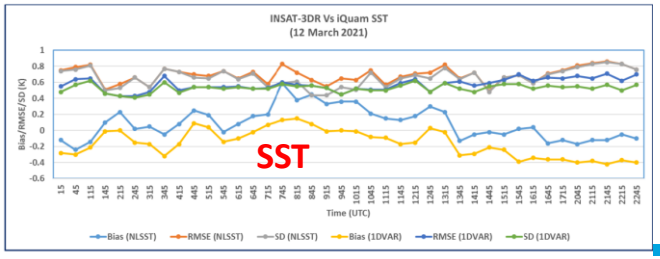
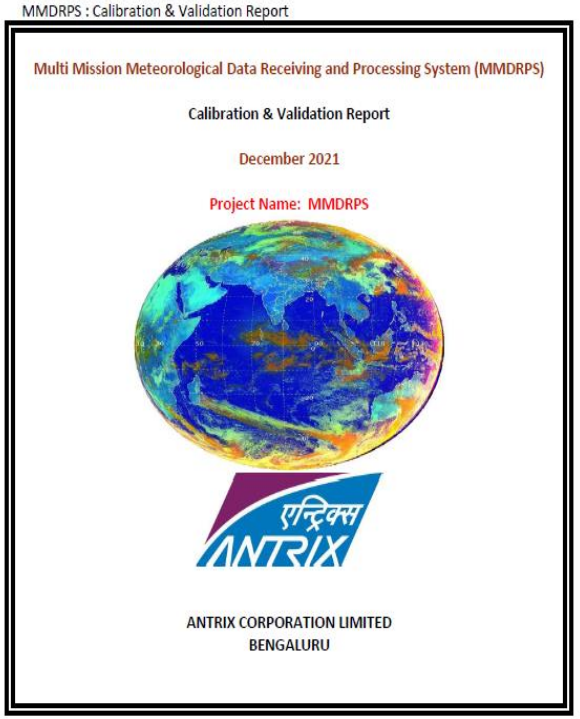


Figure 2: Half-hourly statistics of INSAT-3DR SST w.r.t. iQuam SST for 12 March 2021.



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SARAL/AltiKa: ISRO-CNES Joint Altimeter Mission

(An assessment of geophysical parameters for various phases of operations)

SARAL/AltiKa : Launched Feb, 2013 (First Ka-band Space-borne Altimeter)

9-years of operation and still going strong!

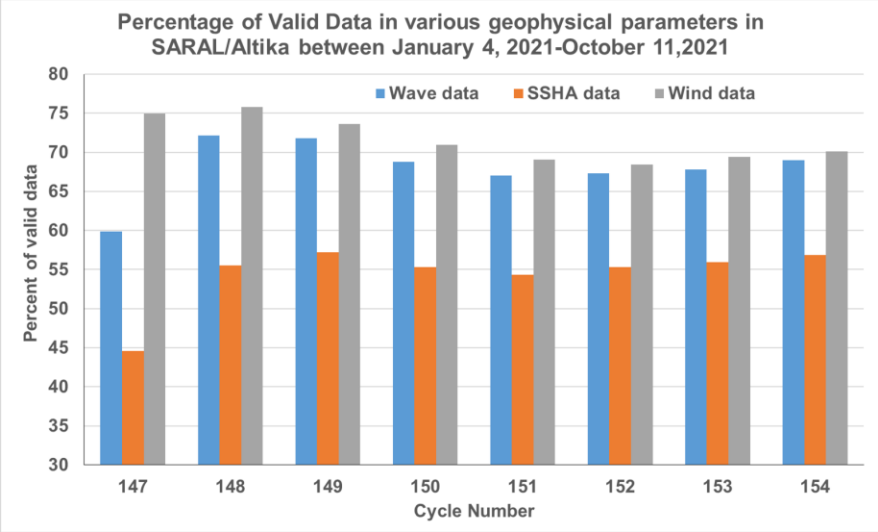
Important component of operational oceanography

Three phases of operations

- Exact Repeat Mode (ERM) – Mar,13 – Jul,16
- Geodetic Mode (GM)- Jul, 16-Jan,19
- Star Sensor anomaly phase (large mis-pointing) Feb, 19 onwards

Assessment for the year 2021

- Nearly 55% of SSHA data, 70% of Wind speed data and 68% of SWH data still remain usable for various ocean applications
- Significant Wave Height (SWH) data still being used in operational wave forecasting models.



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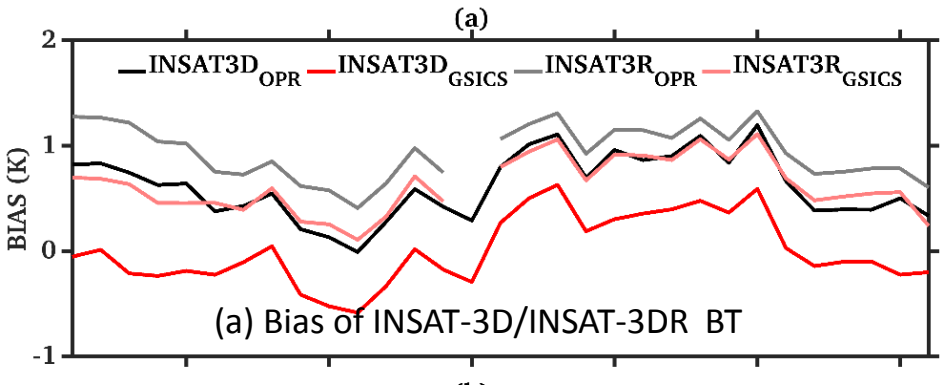
Megha-Tropiques: ISRO-CNES Joint Mission (Status update)

- Since August 2018, Megha-Tropiques experienced an anomaly due to malfunctioning of on-board media system. Because of which a solution of acquiring only every third orbit data is found jointly by ISRO and CNES, and hence post-correction only about 5-6 orbits a day were available from all the sensors (except MADRAS).
- This anomaly aggravated with time, which further restricted availability of data (only ~1.5%).
- The impact of available data (SAPHIR) on operational numerical weather prediction is found to be negligible.
- Also, there is degradation of incidence angle at nadir since mid-February 2022.
- Since March 15, 2022, no data is available.
- A ISRO-CNES Joint Steering Committee meeting was held on 5 May 2022. It is likely that Megha-Tropiques mission will be officially decommissioned soon.
- Megha-Tropiques archived data is available to users from MOSDAC.

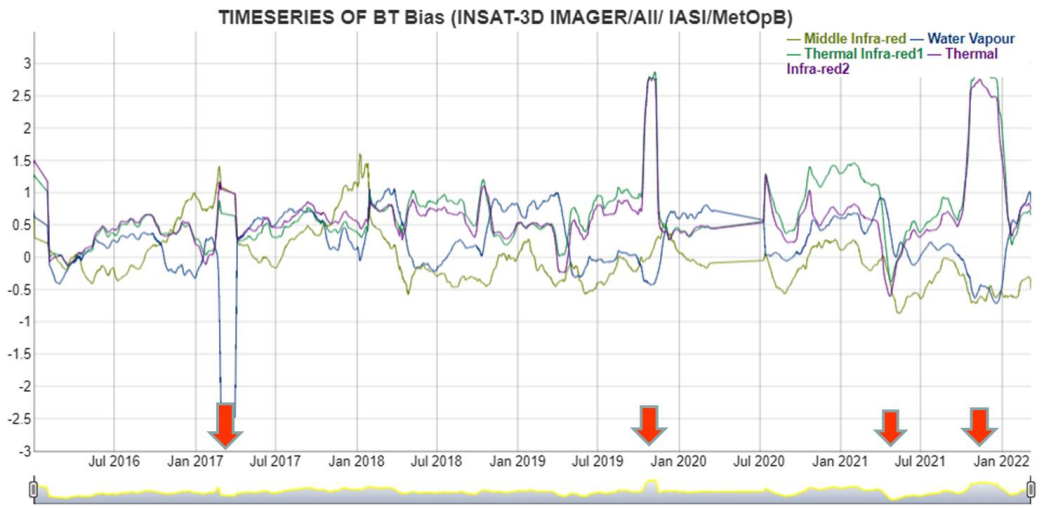
ISRO's GSICS Activities, Action & Achievements Summary

- INSAT-3D/3DR Imager GSICS coefficients for IR Channels are in demo phase
- 2016-2021 matchup data for visible and SWIR channels of INSAT-3D/3DR and MODIS is prepared using Ray-matching method.
- GEO-GEO inter-calibration of INSAT-3D and INSAT-3DR for all channels has been carried out.
- Bias monitoring using NWP forecast/ analysis for WV channel of INSAT-3D/3DR has been done for July 2018.
- Procedure to inter-calibrate INSAT-3D/3DR Imager IR channels using CrIS data is ready and in testing phase.

Error estimate of simulated BT using WRF 09 hr forecast from 1800 GMT with respect to INSAT-3D BT



Bias Monitoring: INSAT-3D Imager vs MetOp-B IASI *Demonstration* Monitor



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Thanks

rashmi@sac.isro.gov.in