



ships4sst

shipborne radiometers for sea surface temperature

Status ISFRN

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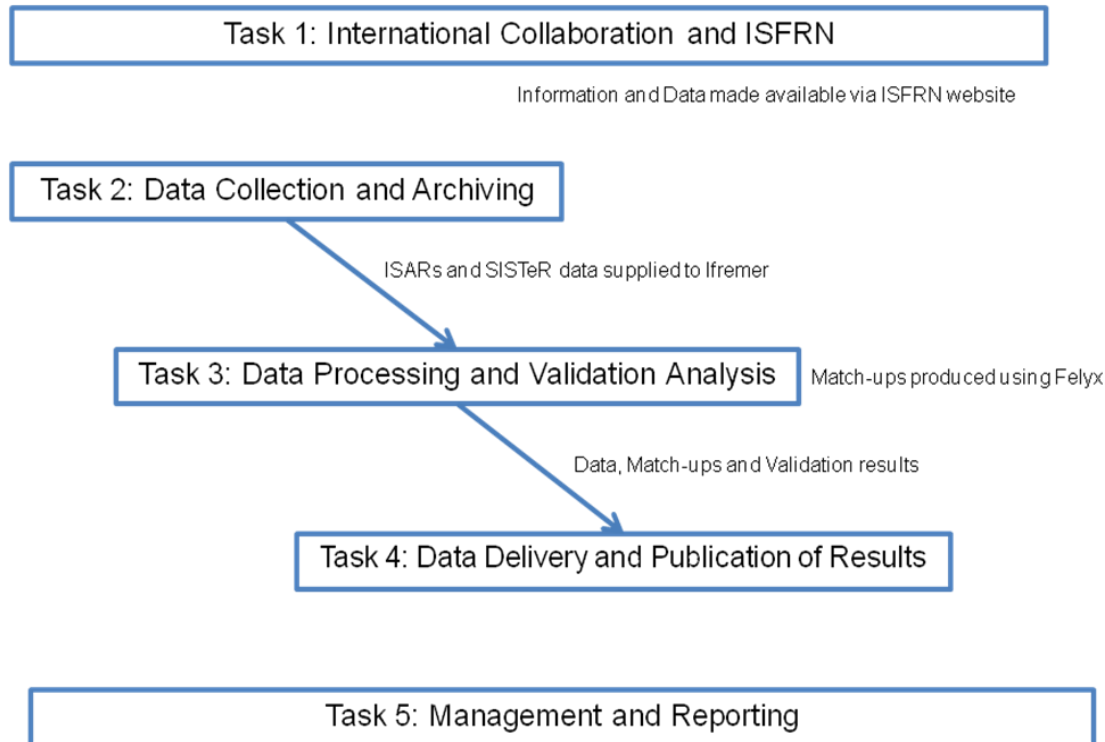
Overview

- Objectives
- Tasks
- International collaboration
- Data Collection
- Archive
- Processing and Validation
- Conclusion

Objectives

- OBJ-1: Validate Sentinel-3A and Sentinel-3B SLSTR L1, L2 and higher order SST products to FRM standards.
- OBJ-2: Maintain and deploy on a continuous basis Thermal Infrared Radiometers (TIR) FRM and necessary supporting instrumentation to validate Sentinel-3 SLSTR SST products.
- OBJ-3: Process, archive and quality control all data following documented FRM procedures that approve their use for FRM satellite validation.
- OBJ-4: Deliver approved data sets and uncertainty budgets to Copernicus and the Sentinel-3 Mission Performance Centre.
- OBJ-5: Collaborate with appropriate International Scientists and Agencies using TIR for satellite validation as an International SST FRM Radiometer Network.
- OBJ-6: Prepare and submit peer-reviewed journal articles.
- OBJ-7: Conduct communications and outreach material promoting Copernicus Sentinel-3 SLSTR and the SLSTR-SST-FRM-Validation project.

Project Tasks



Task 1

- International collaboration
 - Invite other TIR operators to convert/produce data in L2R format and upload it to the ships4sst archive.
 - RSMAS, CISRO have produce L2R data for M-AERI and ISAR
 - ISAR Training in Korea
 - Potential collaboration with South Africa on instrument loan.
 - Discussions with AIR and SemSAS
- webpage
 - www.ships4sst.org
 - Information, protocols, data format, archive
- Twitter
 - @ships4sst
- Outreach
 - talks with Cunard about publicity (i.e. contributing to Cunard's magazine)
 - Conferences
 - GHRSSST, Living Planet, s3vt

webpage

ships4sst Aim Instruments Partners Documents News Services

Search

SHIPBORNE RADIOMETER FOR SEA SURFACE TEMPERATURE

Welcome to the Shipborne Radiometer Network!

The International Sea Surface Temperature (SST) Fiducial Reference Measurement (FRM) Radiometer Network (ISFRN) sets out to develop and promote an international network of ocean and remote sensing scientists who share a particular interest in promoting and improving the use of shipborne infrared radiometers for measuring skin SST at the surface of the ocean, comparable to measurements made by satellite infrared radiometers. This includes operators, designers and builders of such instruments as well as the user of the data.

The scope of the ISFRN activity can cover all aspects of the science and technology of shipborne radiometers used to measure SST. This includes

- exchange of operating advice and information that promote best practice for radiometer deployments,
- establishing protocols for shipborne radiometry including the validation of observations traceable to NMI reference standards,
- agreeing formats for skin SST data retrieved from ship radiometers,
- setting procedures for quality control in order to meet agreed standards of accuracy, and
- provide a single access point of the data collected around the world.

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TAKE A LOOK AT OUR INSTRUMENTS

SERVICES CONTACT

Sign up to the Shipborne-radiometer network

JOIN

Department for Business, Energy & Industrial Strategy

esa
European Space Agency

fiducial reference temperature measurements

NERC
SCIENCE OF THE ENVIRONMENT

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27 February 2019

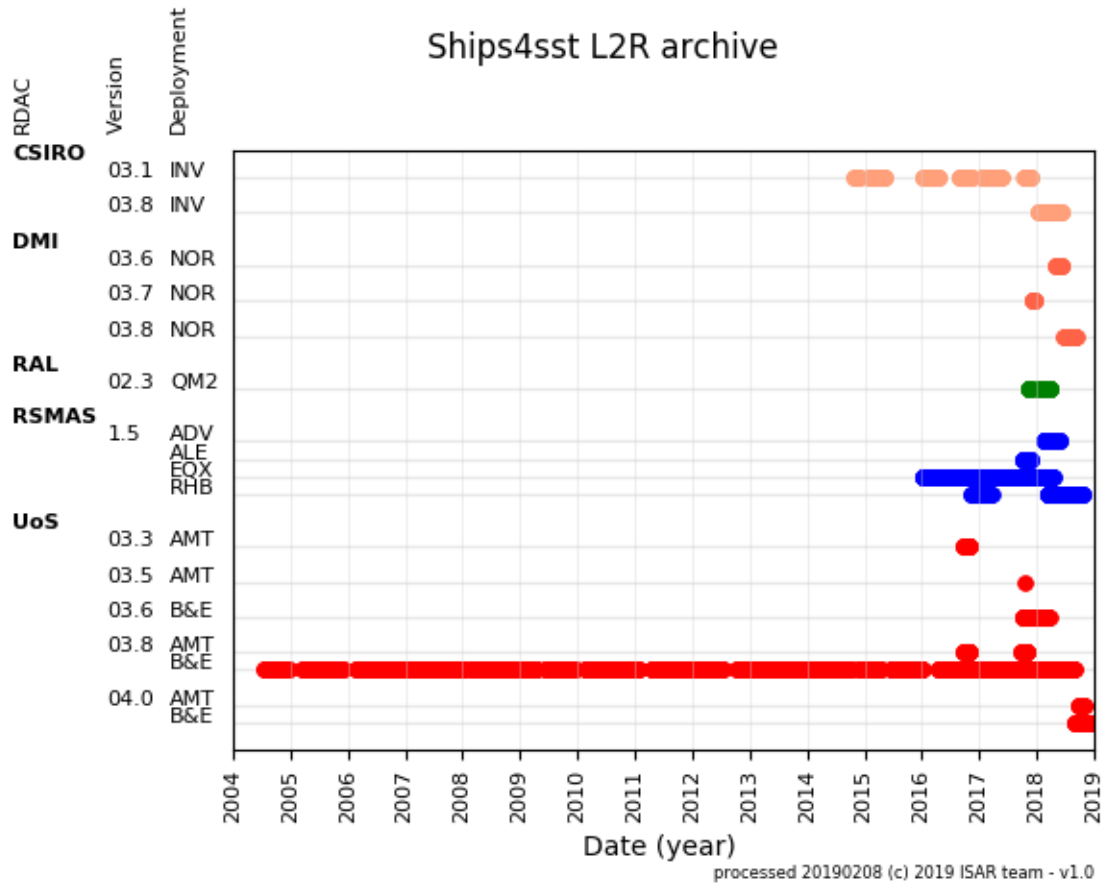
Task 2

- Data Collection
 - UoS – 6 deployments
 - DMI – 4 deployments
 - RAL – 4 deployments

- Archive
 - <ftp.ifremer.fr>
 - Instrument -> RADC-> software version -> year
 - Data

Task 2

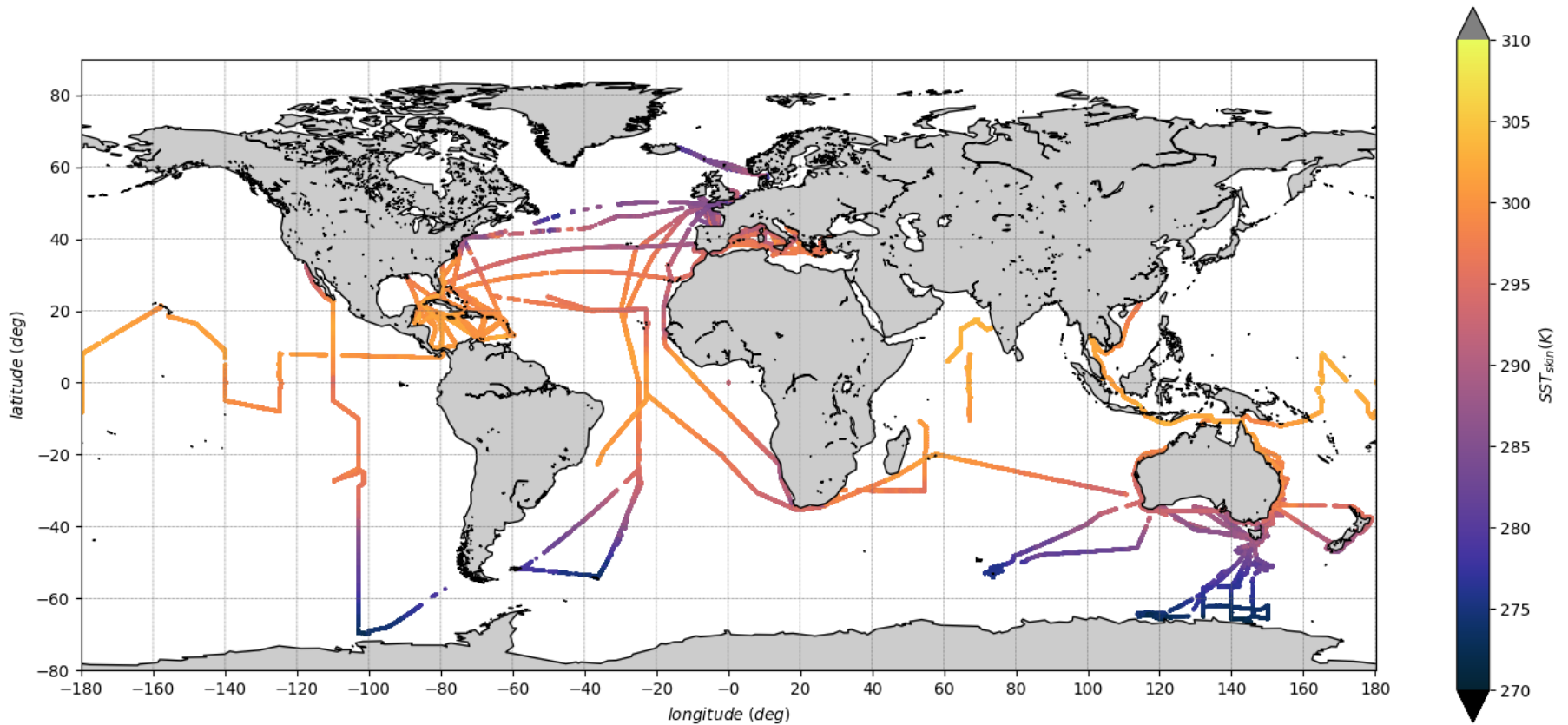
- Archive



Task 2

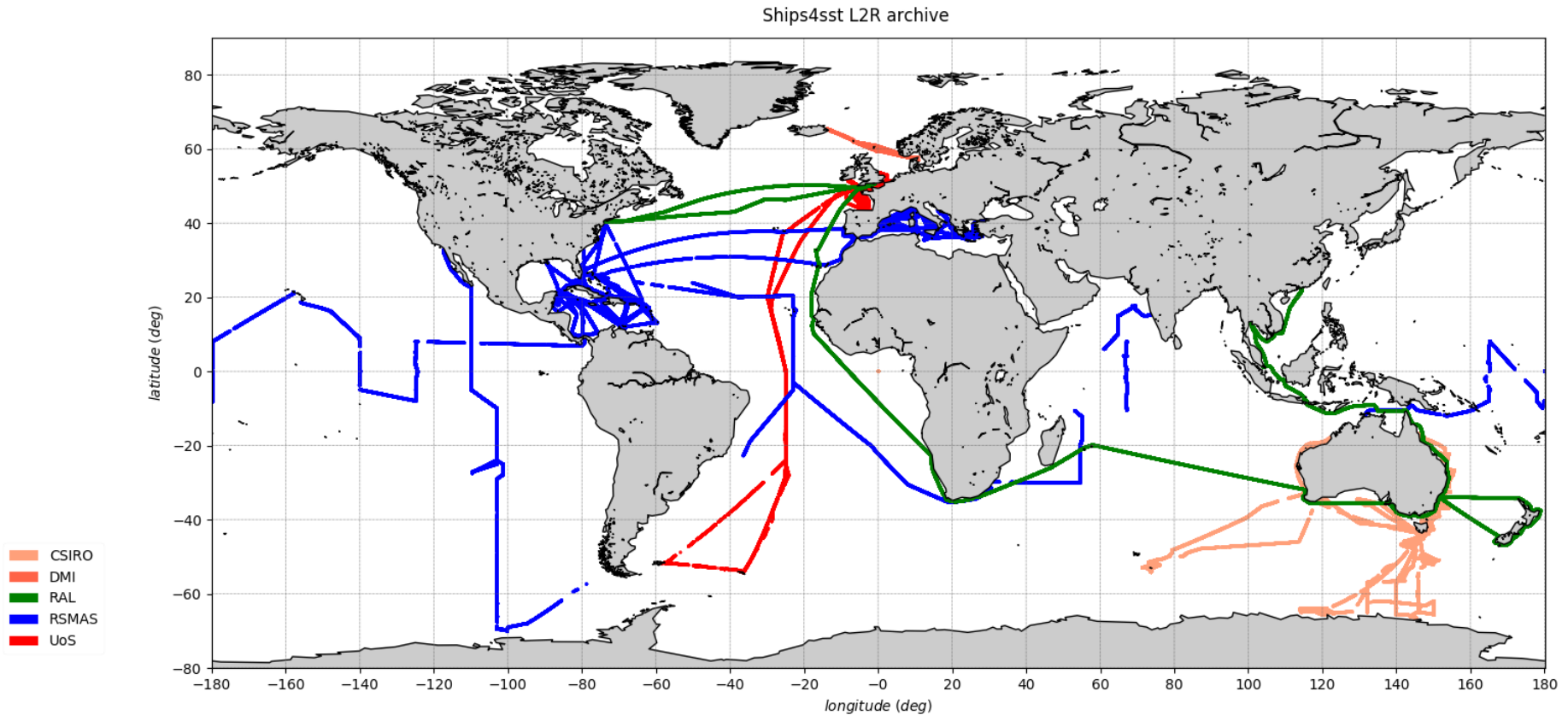
- Archive

Ships4sst L2R archive



Task 2

- Archive



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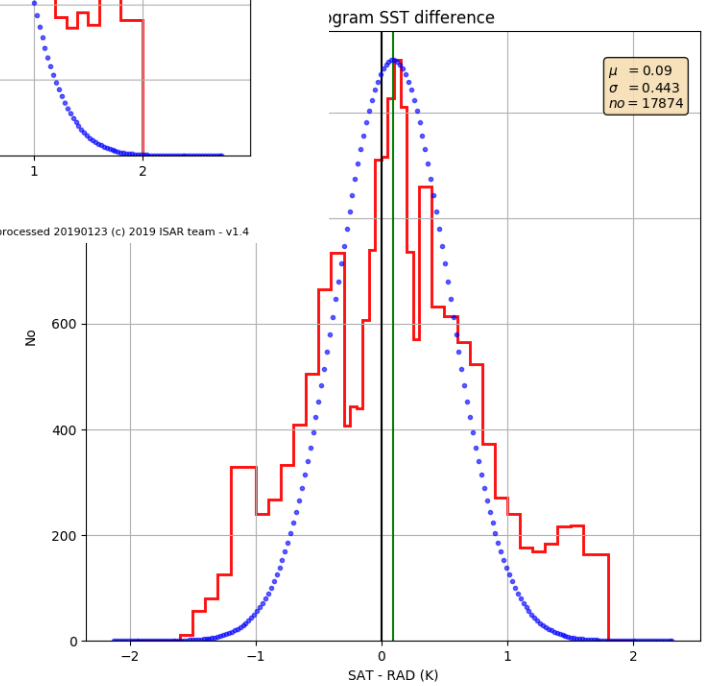
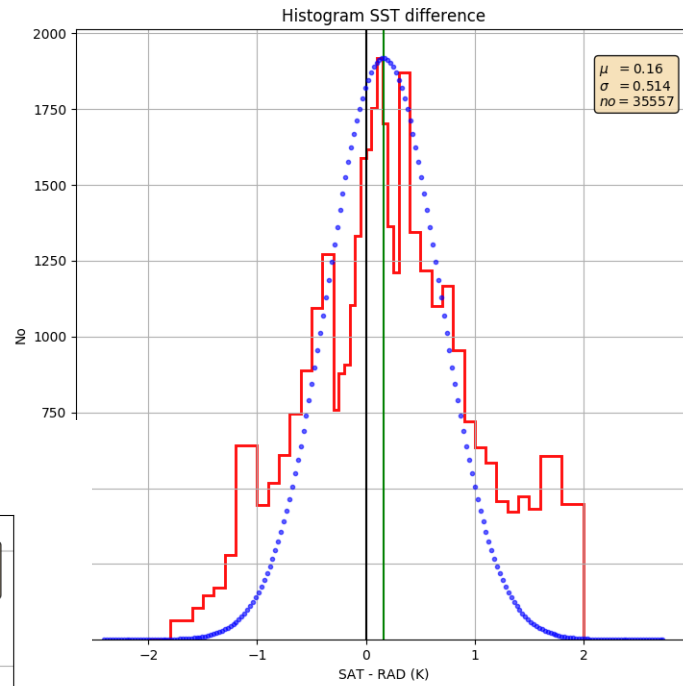
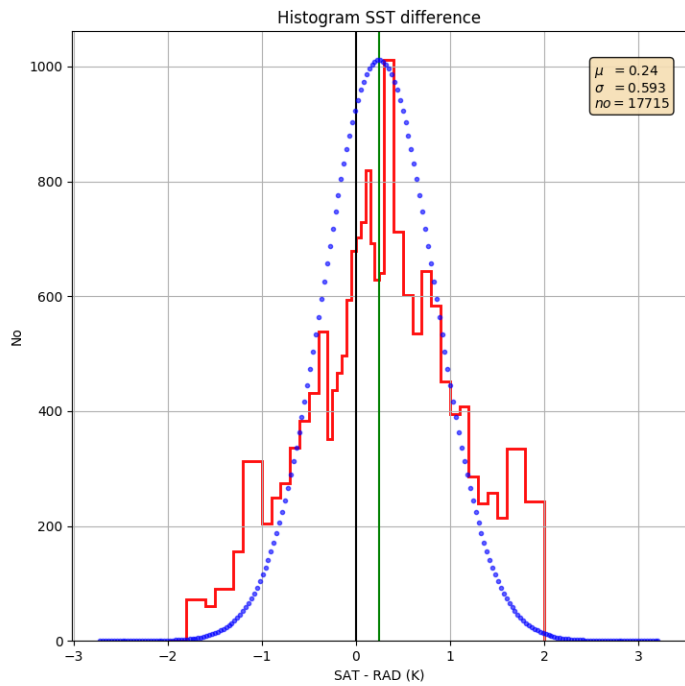
Task 3

- Data processing and validation
 - Felyx MDB generation at Ifremer/EUMETSAT
 - SLSTR L1b and L2 data within 400x400 pixels of matchup
 - L2R data within 6hrs of matchup
 - MDB analysis tool
 - Uses Wimmer et.al 2012 approach
 - Currently WST only
 - 2016 ,2017, 2018

Grade	Time	Spatial
1	±0.5 h	± 1km
2a	±0.5 h	±20km
2b	±2 h	± 1km
3	±2 h	±20km
4	±6 h	±25km

Wimmer, W., Robinson, I. S., & Donlon, C. J. (2012). [Long-term validation of AATSR SST data products using shipborne radiometry in the Bay of Biscay and English Channel](#). *Remote Sensing of Environment*, 116, 17-31. DOI: [10.1016/j.rse.2011.03.022](https://doi.org/10.1016/j.rse.2011.03.022)

Task 3



all, sstdiff_sst_wst, grade 2b, day, ghrsst-all - HuberT

processed 20190123 (c) 2019 ISAR team - v1.4

diff_sst_wst, grade 2b, all, ghrsst-all - HuberT

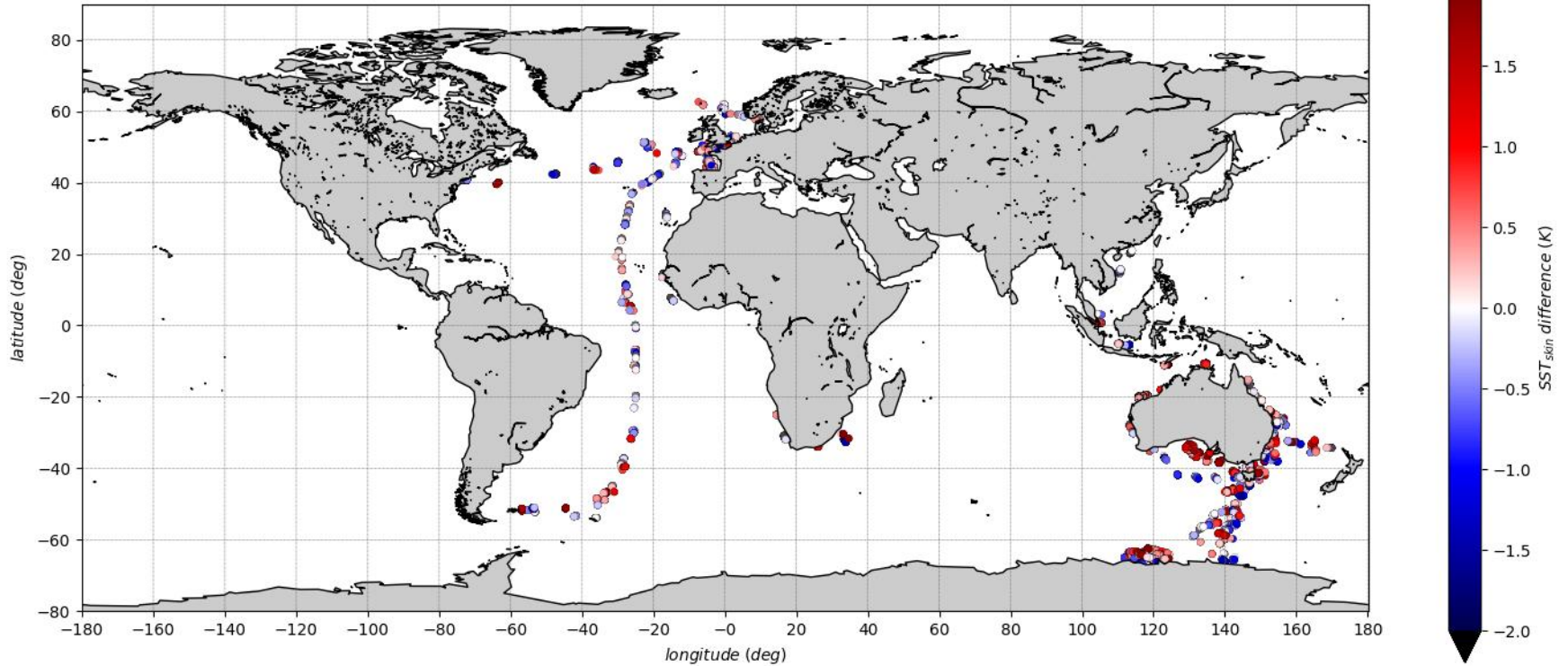
processed 20190123 (c) 2019 ISAR team - v1.4

all, sstdiff_sst_wst, grade 2b, night, ghrsst-all - HuberT

processed 20190123 (c) 2019 ISAR team - v1.4

Task 3

Match-up Locations



all, sstdiff_sst_wst, grade 2b, all, ghrsst-all - HuberT

processed 20190123 (c) 2019 IS,

Task 3

All				
Grade	Mdiff	RSD	No	Overpass
1	0.17	0.51	5986	334
2a	0.17	0.51	11972	334
2b	0.16	0.51	35557	388
3	0.16	0.51	59132	388
4	0.16	0.51	82727	388

PtA				
Grade	Mdiff	RSD	No	Overpass
1	0.01	0.26	621	68
2a	0.01	0.26	1242	68
2b	0.00	0.29	3528	93
3	0.00	0.29	5816	93
4	0.00	0.30	8098	93

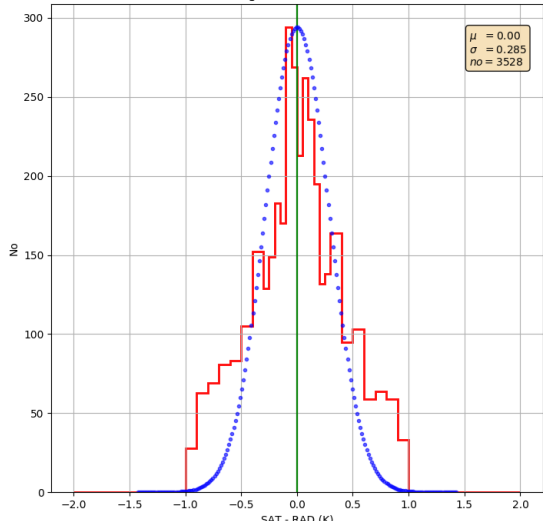
Day				
Grade	Mdiff	RSD	No	Overpass
1	0.27	0.57	3011	174
2a	0.26	0.50	4708	154
2b	0.24	0.59	17715	207
3	0.24	0.60	29412	207
4	0.24	0.60	41131	207

Day				
Grade	Mdiff	RSD	No	Overpass
1	0.01	0.25	471	50
2a	0.01	0.25	942	50
2b	0.01	0.28	2661	70
3	0.00	0.29	4389	70
4	0.00	0.30	6132	70

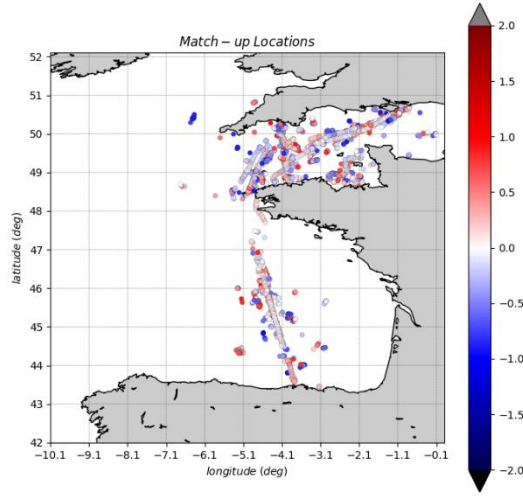
Night				
Grade	Mdiff	RSD	No	Overpass
1	0.08	0.44	2977	162
2a	0.08	0.44	5954	162
2b	0.09	0.44	17874	182
3	0.09	0.44	29796	182
4	0.09	0.44	41716	182

Night				
Grade	Mdiff	RSD	No	Overpass
1	0.00	0.26	151	18
2a	0.00	0.26	302	18
2b	-0.02	0.28	865	23
3	-0.02	0.29	1436	23
4	-0.03	0.29	2005	23

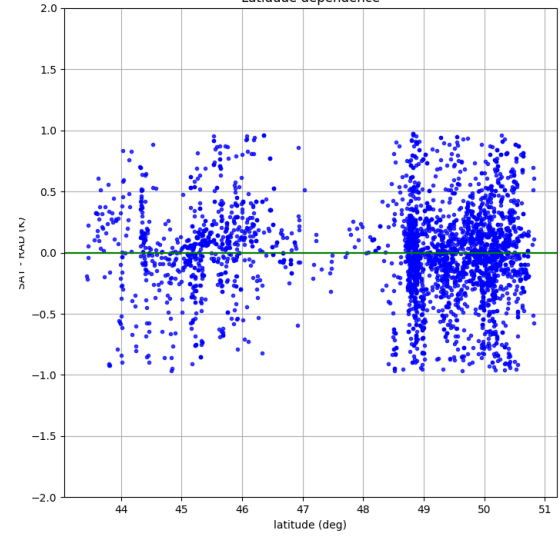
Histogram SST difference



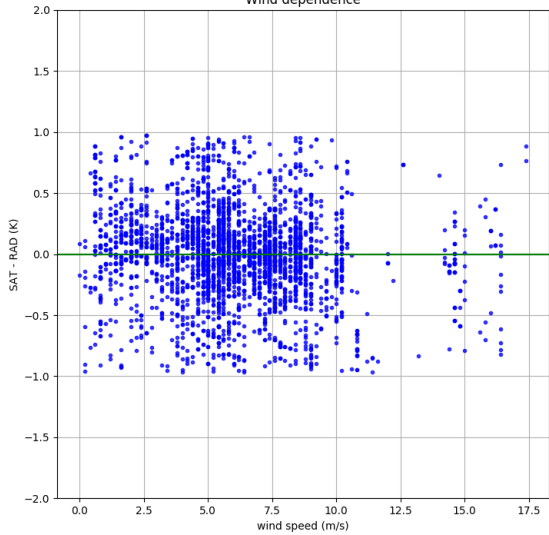
Match-up Locations



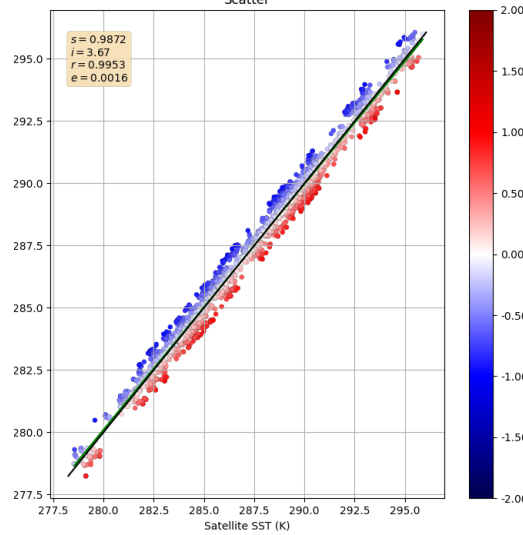
Latitude dependence



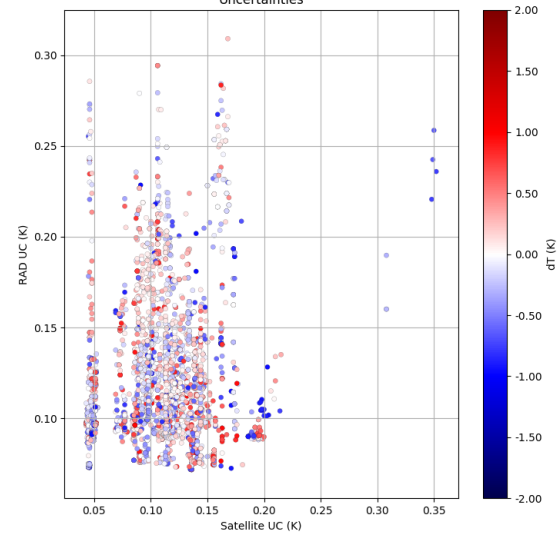
Wind dependence



Scatter



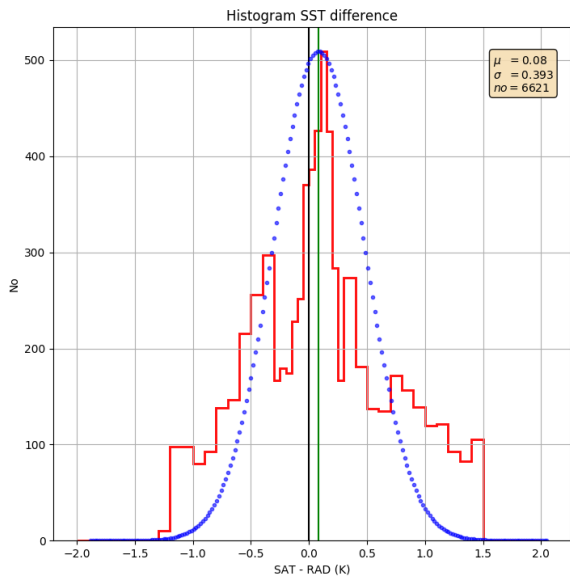
Uncertainties



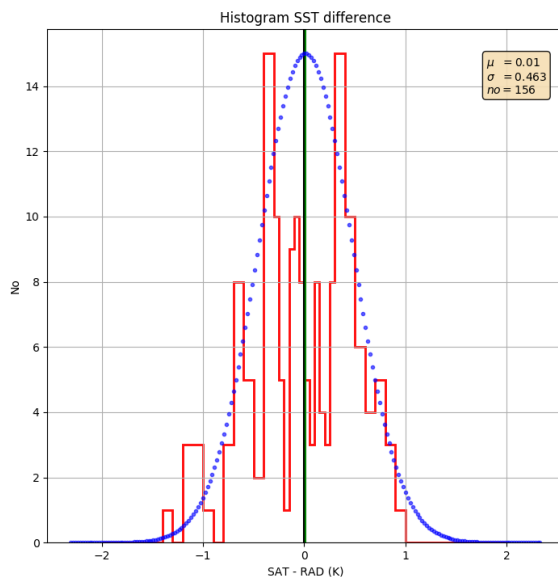
s4sstPA, sstdiff_sst_wst, grade 2b, all, ghrsst-all - HuberT processed 20190123 (c) 2019 ISAR team - v1.4

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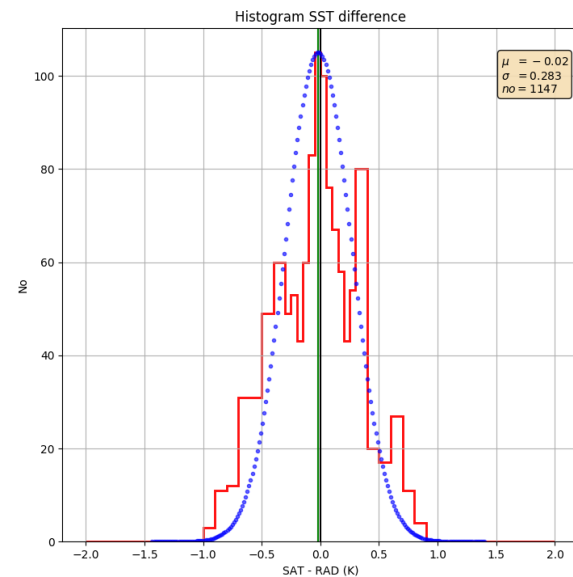
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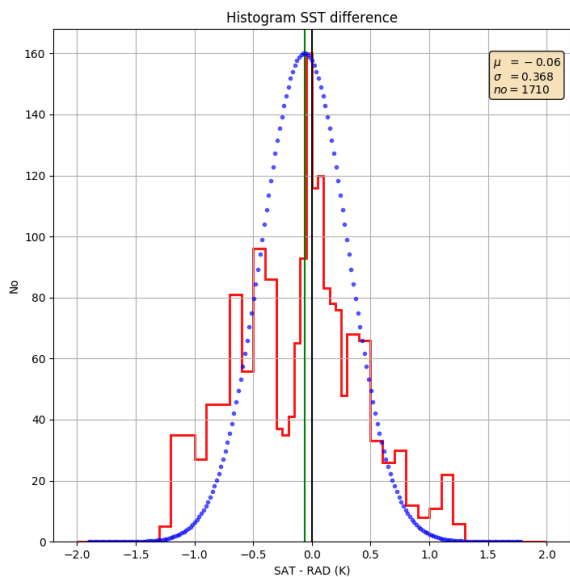
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s4sstPJA, sstdiff_sst_wst, grade 2b, all, ghrsst-all - HuberT

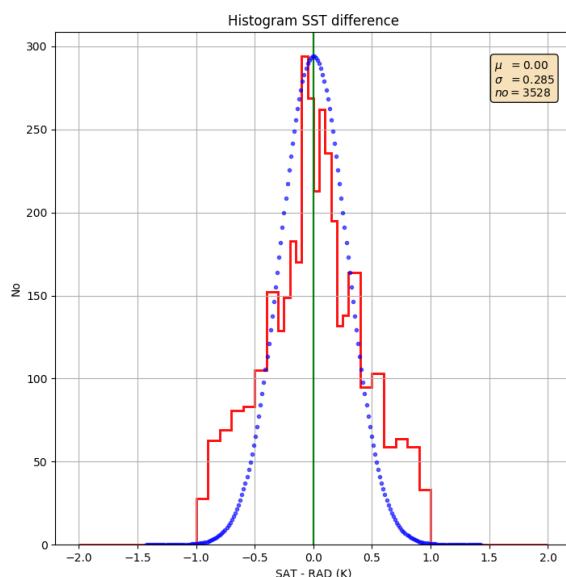


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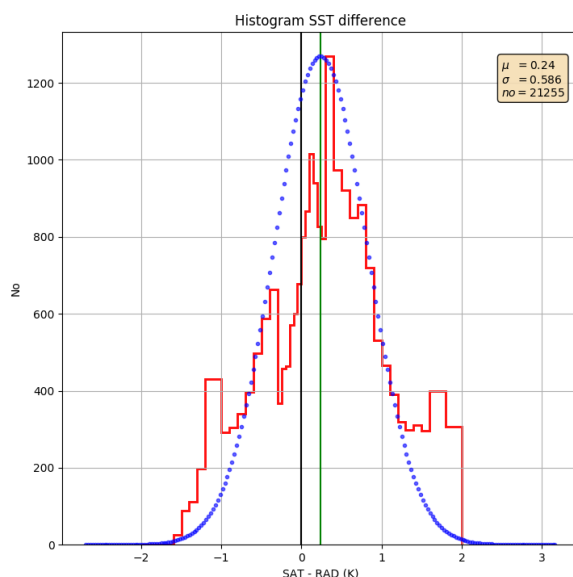
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s4sstPMA, sstdiff_sst_wst, grade 2b, all, ghrsst-all - HuberT

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s4sstVLMJ, sstdiff_sst_wst, grade 2b, all, ghrsst-all - HuberT

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Task 4

- Data Delivery
 - On archive

- Publications
 - Papers in preparation
 - A comparison between AATSR and SLSTR SST data using ISAR observations
 - The International SST FRM Radiometer Network
 - Conferences
 - GHRSSST
 - Living Planet
 - S3VT

Conclusion

- International Collaboration
 - Good progress
- Data Collection
 - Progressing as planned
- Archive
 - M-AERI and CISRO ISAR data
- Data Processing and Validation
 - Good WST results
 - Still needs D3, D2, N3, N2 data in MDB