

# Operational Status and Updates of the EUMETSAT SST/IST

## Multi-Mission Matchup Dataset

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### 1. Context & Motivation

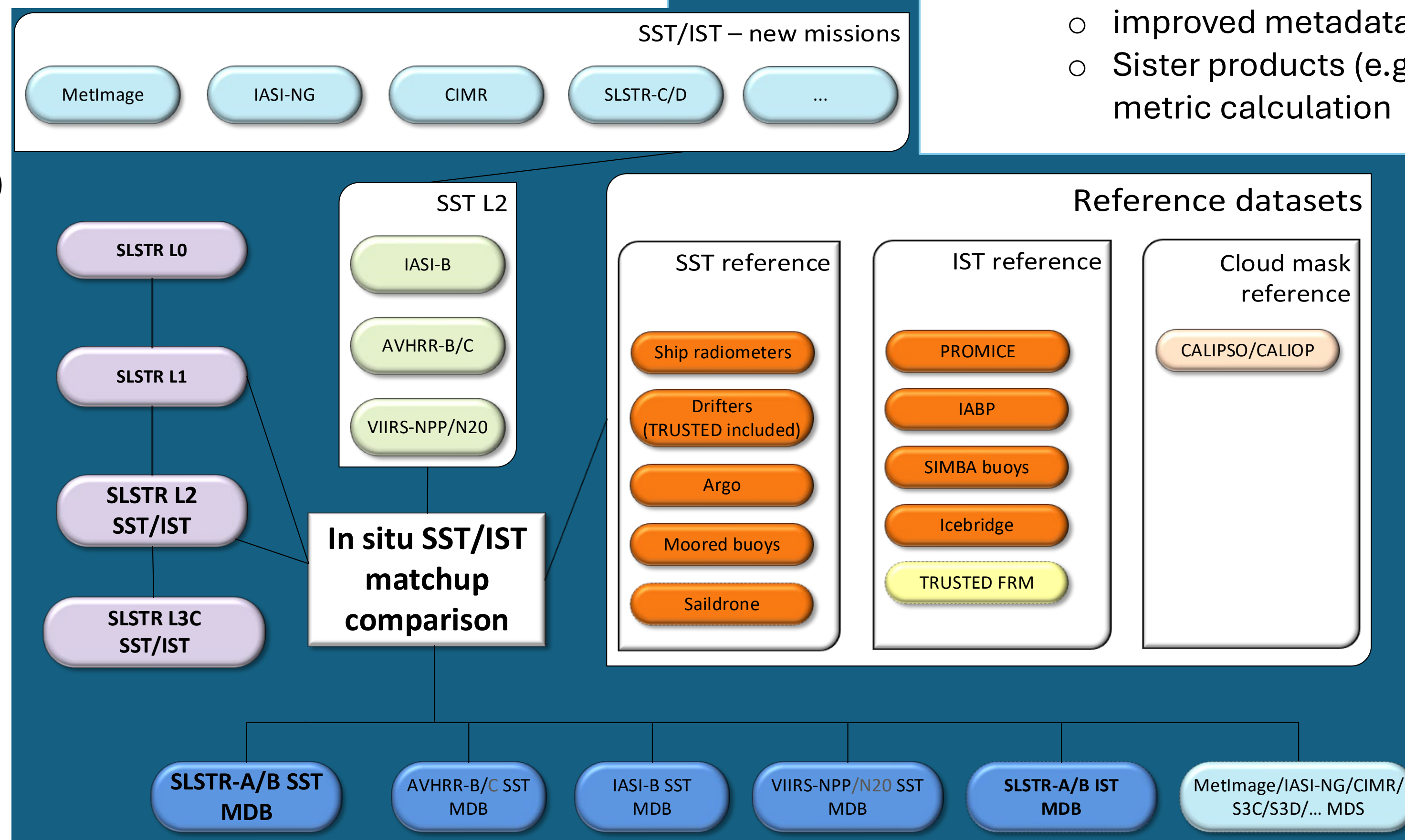
- The Multi-Mission Match-Up Dataset (MMD) framework, evolved within the EUMETSAT Sci4MaST project, supports the calibration and validation (Cal/Val) of satellite-derived Sea Surface Temperature (SST) and Sea-Ice Surface Temperature (IST).
- MMD:**
  - Systematic satellite and in situ matchup generation for SST/IST validation
  - Support for Near-Real-Time (NRT), offline, reprocessed, validation datasets
  - Multi-mission capability: Sentinel-3 SLSTR, MetOp AVHRR/IASI, VIIRS-NPP, ...
  - Multiple in situ reference types: drifters, Argo, moored buoys, FRM (TRUSTED, ship-borne radiometers)
  - Generic and configurable → can be extended to other parameters and missions
  - Open source: felyx (v2), cerbere (v3), jobard

### 2. MMD Overview

- Satellite datasets:**
  - S3A/B SLSTR SST/IST + SLSTR L1 RBT/MET + SLSTR L0 (2027)
  - AVHRR-B/C SST (OSI-SAF), IASI-B SST (OSI-SAF), VIIRS-NPP SST (NOAA OSPO), ...
- In situ reference datasets:**
  - SST: CMEMS: drifters, Argo, moored buoys
  - SST FRM: TRUSTED drifters, ship-borne radiometers (ISFRN)
  - IST: Promice, IABP, SIMBA, Icebridge
  - IST FRM: TRUSTED IST
- Matchup format:**
  - Core NC file (L2:WST) + AUX NC files (L1:MET/RBT)
  - Full traceability to source satellite and in situ products
  - Evolutions:
    - improved metadata, harmonised variable naming convention
    - Sister products (e.g. L1/L2) + extractions (no miniprods) metric calculation

### 4. SST Matchup Datasets

- SLSTR SST MD (Collection 3): Q2/2016-Q2/2026**
  - Drifters/Argo/moored:**
    - Repro MD: 2016/04-2018/04 (SLSTR-A)
    - NRT MD: 2018/04 (SLSTR-A), 2019/03→(SLSTR-B)
  - TRUSTED MD:**
    - NRT MD: 2019/02 → (SLSTR-A/B)
  - Radiometers (Ships4SST) MD:**
    - Repro MD: 2016/04-2018/04 (SLSTR-A)
    - NRT MD: 2018/04-12/2025 (SLSTR-A/B)
- OSI-SAF AVHRR-B / IASI-B / VIIRS-NPP SST MD:**
  - Drifters/Argo/moored MD v1 (similar time period)
  - Internal Cal/Val usage but available per request
  - Migration to new MDBv2 in 2026 Q2
- SLSTR SST MDv2 (Collection 4): Q4/2025-**
  - Based on SLSTR PreOP Coll4: from 2025/09
  - SLSTR-A/B SST Coll4 MDv2 from 2026 Q2 (OPE)
  - Full SLSTR-A/B/C SST Coll4 MDv2 reprocessing:
    - 2027/2028 (TBC)

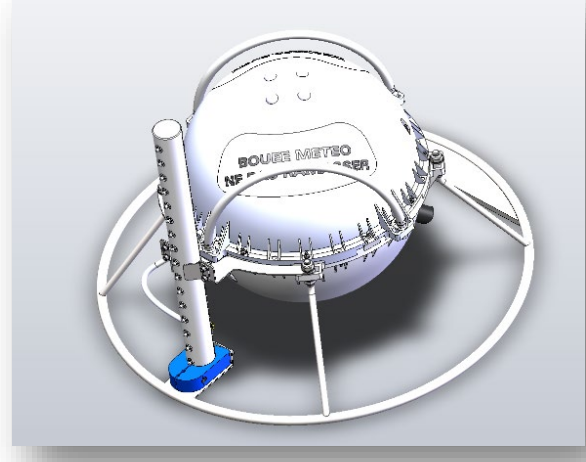


### 3. Technology Stack (Overview)

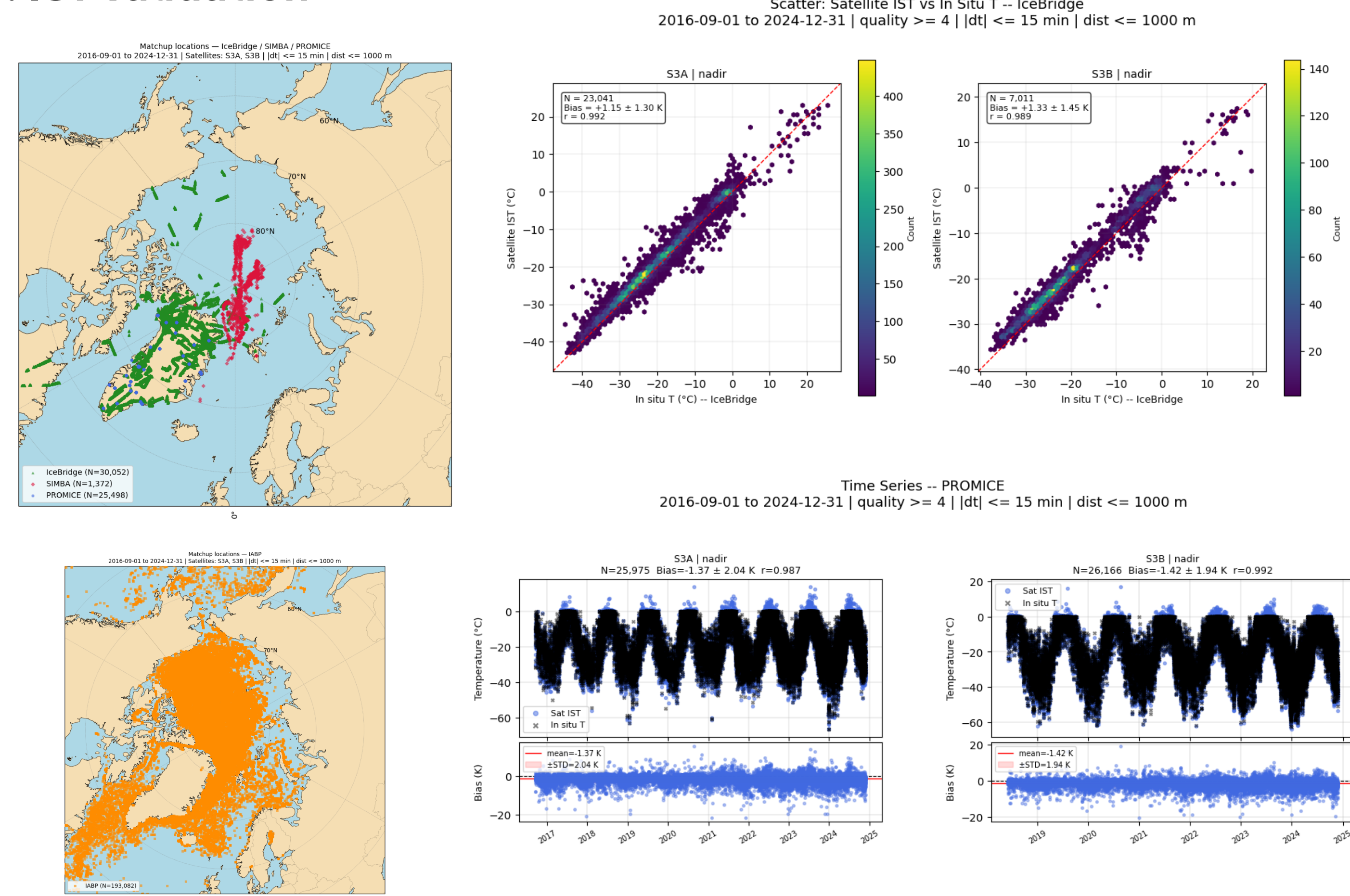
- Processing: Felyx v2 framework (Ifremer/Sci4MaST)
- Workflow: Apache Airflow (DAG-based)
- Batch/HPC: HTCondor cluster (parallel job scheduling) + Jobard
- Cloud: WEKEO (Docker Swarm, S3-compatible storage → k8s)
- CI/CD: GitLab CI + Ansible (automated deployment)
- Monitoring: Prometheus + Elasticsearch + Grafana
- Formats: NetCDF/HDF/... (MMD), Apache Parquet (in situ)
- Open source:
  - Felyx: <https://felyx.readthedocs.io>
  - Jobard: <https://jobard.gitlab-pages.ifremer.fr/documentation>

### 5. IST Matchups Datasets

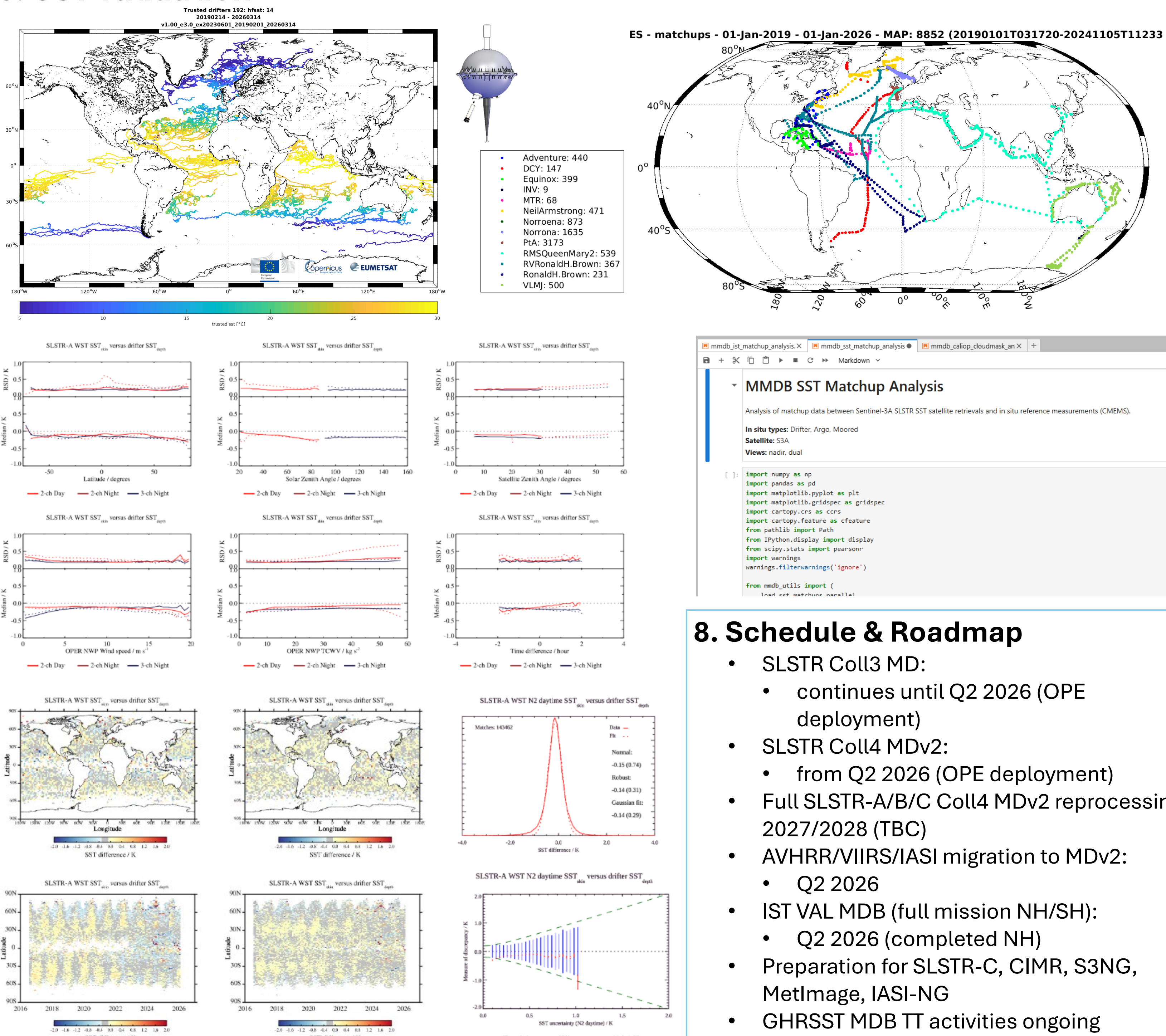
- SLSTR IST MDv2 (felyx v2):**
  - IST: PROMICE/IABP/Icebridge/Simba:**
    - SLSTR-A/B ISTVAL MDB 2016-2024, NH (completed)
  - Cloud mask: CALIPSO/CALIOP**
    - SLSTR-A/B ISTVAL MDB 2016-2024, NH (completed)
    - SLSTR-A/B ISTVAL MDB 2016-2024, SH (in progress)



### 7. IST validation



### 6. SST validation



### 8. Schedule & Roadmap

- SLSTR Coll3 MD:**
  - continues until Q2 2026 (OPE deployment)
- SLSTR Coll4 MDv2:**
  - from Q2 2026 (OPE deployment)
- Full SLSTR-A/B/C Coll4 MDv2 reprocessing: 2027/2028 (TBC)
- AVHRR/VIIRS/IASI migration to MDv2:
  - Q2 2026
- IST VAL MDB (full mission NH/SH):
  - Q2 2026 (completed NH)
- Preparation for SLSTR-C, CIMR, S3NG, MetImage, IASI-NG
- GHRSSST MDB TT activities ongoing

### 9. Data Access & Distribution

- SLSTR SST MD access:**
  - <sftp://s3calval.eumetsat.int>
  - Available to Sentinel-3 Validation Team (S3VT) members
- SLSTR IST MD access:**
  - Available to S3VT per request: [s3.ist@eumetsat.int](mailto:s3.ist@eumetsat.int)
- Other mission MDs (AVHRR, IASI, VIIRS):**
  - Available to S3VT per request: [s3.sst@eumetsat.int](mailto:s3.sst@eumetsat.int)
- Pre-operational Coll4 SST/IST data:**
  - <sftp://slstr-sstist-preop.wekeo.eumetsat.int>
  - Monitoring: <https://s3calval.eumetsat.int/ma/sst/slstr-sstist-preop/>
- S3VT access
  - Request MMD access: [s3.sst@eumetsat.int](mailto:s3.sst@eumetsat.int)

### 11. Summary

- Multi-mission matchup datasets produced for SLSTR-A/B SST (Coll3: drifters, Argo, moored, TRUSTED, radiometers; Coll4: from 2025/09) and SLSTR IST S3A/S3B (full mission)
- MMD access available to S3VT members via <sftp://s3calval.eumetsat.int>; other mission MMDs available per request
- Scalable cloud-native framework (felyx v2 + HTCondor + Docker Swarm) deployed on WEKEO, supporting NRT and reprocessing campaigns
- Transition to Coll4 MDv2 in Q2 2026; full reprocessing planned for 2027/2028; preparing for future missions (SLSTR-C, CIMR, S3NG)
- Notebooks soon completed (generic across SST&IST domains)

### Acknowledgements

We would like to acknowledge Copernicus Science for Marine Surface Temperature project (Sci4MaST - <https://www.eumetsat.int/Sci4MaST/>): Ifremer (J.F. Piolle, E. Bodere), Noveltis team (C. Ribere, M. El Hajj), The European Commission Copernicus Programme, Copernicus WEKEO and EUMETSAT Ocean and Sea-ice SAF (for IST/SST L3 processors).



### References & links

Felyx v2: <https://felyx.readthedocs.io>  
Jobard: <https://jobard.gitlab-pages.ifremer.fr/documentation/>  
EO-dataflow: <https://eo-dataflow.gitlab-pages.ifremer.fr/eo-dataflow-doc/index.html>  
EUMDAC: <https://user.eumetsat.int/resources/user-guides/eumetsat-data-access-client-eumdac-guide>

