

Status and recent developments of the EUMETSAT scatterometer missions

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IOVWST Salt Lake City
29 May 2024



EPS-SG

Overview

SCA

Update on the mission status, planned activities

ASCAT

Instrument status and current work

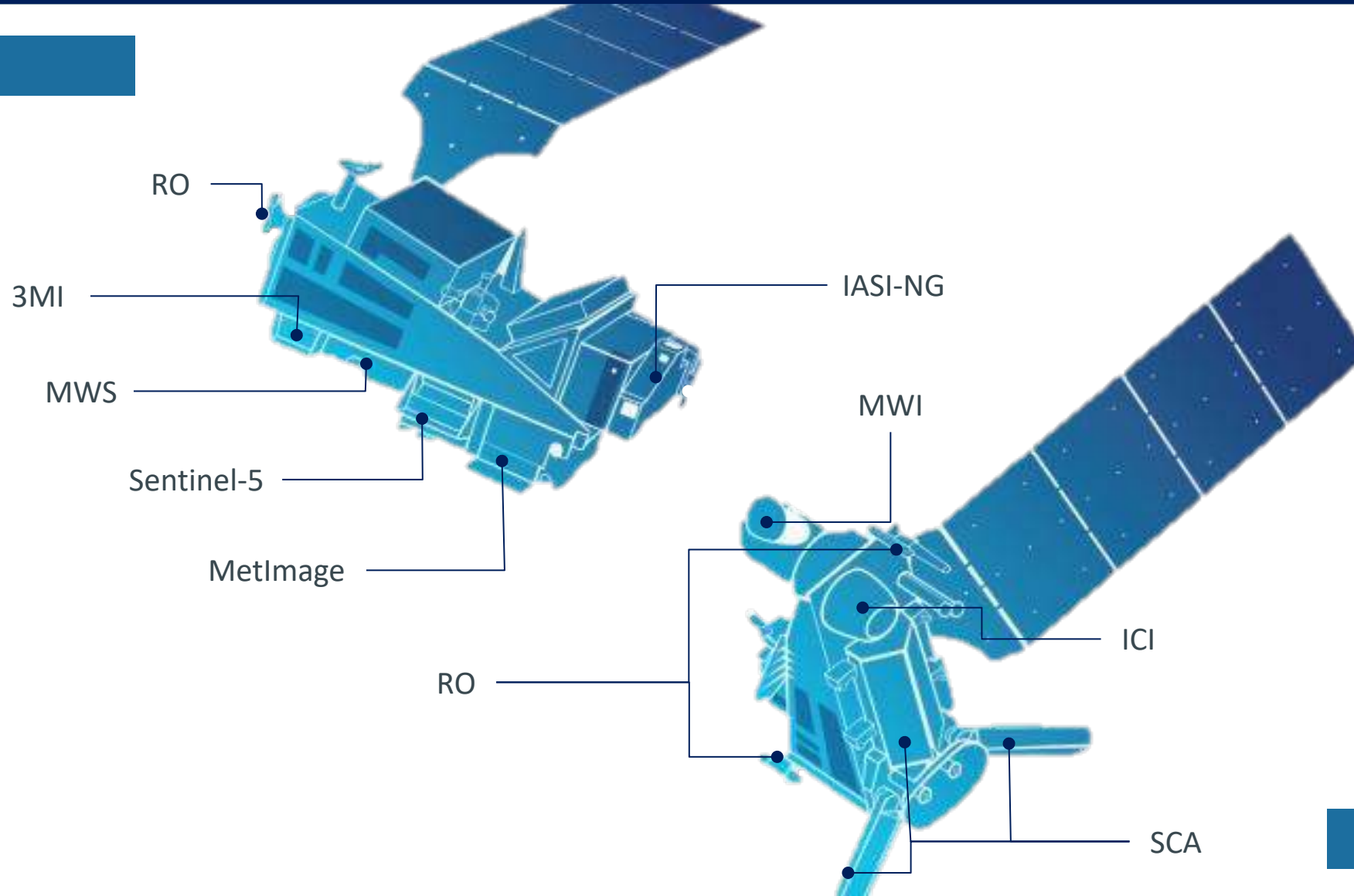


- **Primary mission:** further improve observational inputs to Numerical Weather Prediction models.
- **Continuation and enhancement of service** from mid-morning polar orbit in 2025 – 2046 timeframe
- Significant contributions to other **real time applications:** Nowcasting at high latitudes; Marine meteorology and operational oceanography; Operational hydrology; Air quality monitoring.
- **Climate monitoring:** expand by 20+ years the climate data records initiated in 2006 with EPS (first generation).



EPS-SG: Metop-SG satellites and instruments

Sat-A

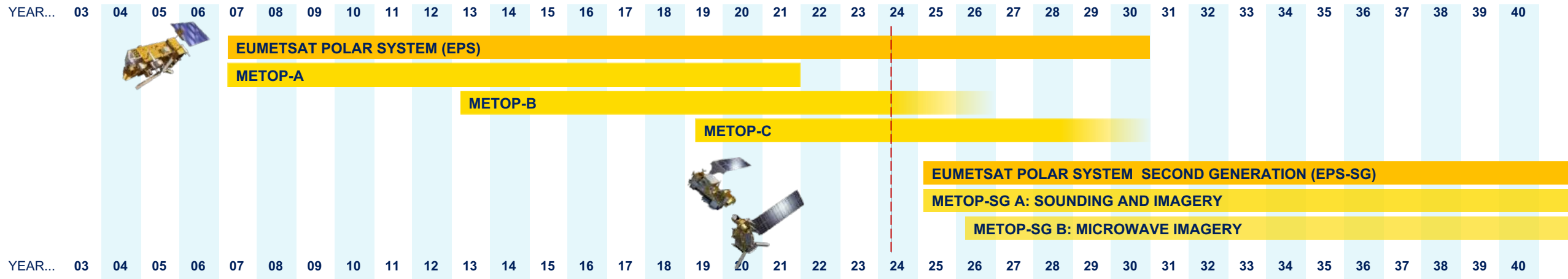


Sat-B



EUMETSAT scatterometer missions

www.eumetsat.int



Metop

- ASCAT-A (19 October 2006 – 15 November 2021)
- ASCAT-B (launched 17 September 2012)
- ASCAT-C (launched 07 November 2018)

Metop-SG

- Scatterometer instruments (SCA) are on the SAT-B series
- SG-A1 launch planned for Q1/2025
- **SG-B1** launch planned for **Q1/2026**

[<https://www.eumetsat.int/planned-launches>]



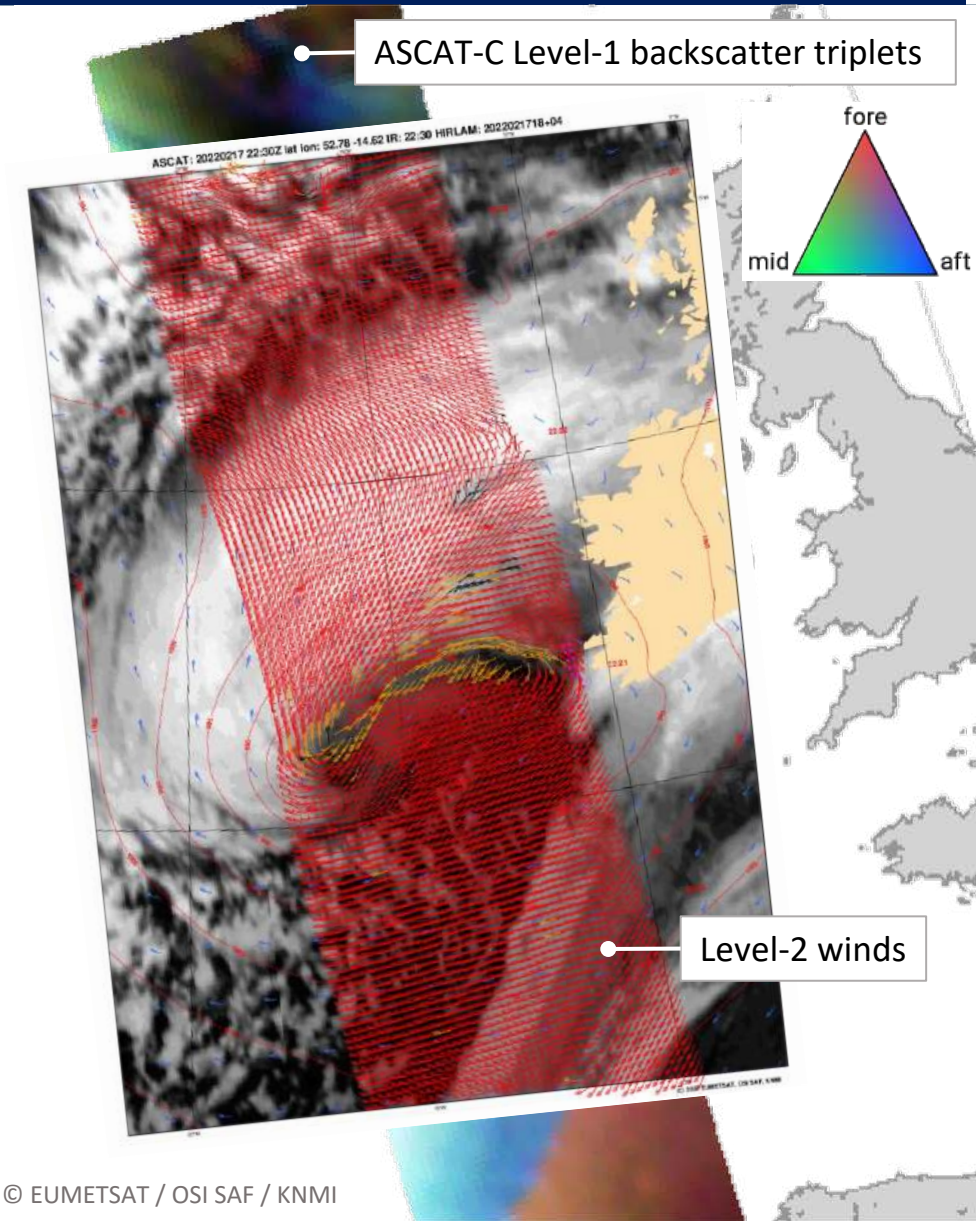
Scatterometer instruments

First Generation – ASCAT

- Frequency 5.255 GHz (C-band)
- Swath width 550 km
- Incidence angles
 - 25° to 53° (mid beams)
 - 34° to 65° (side beams)
- Polarization: VV

Second Generation – SCA

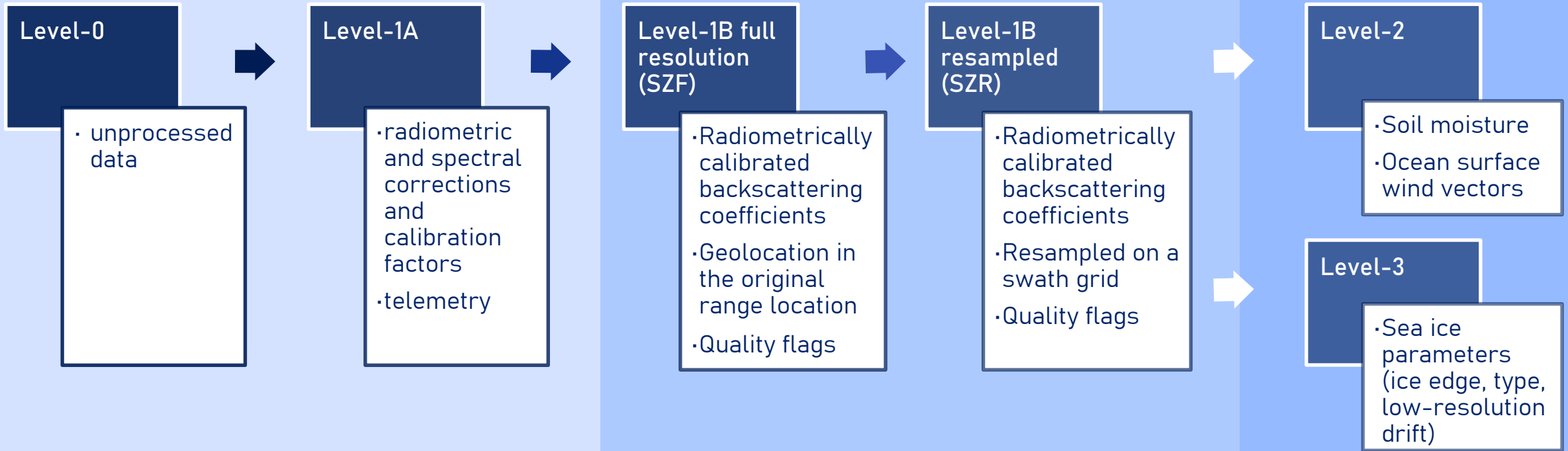
- Frequency 5.355 GHz (C-band)
- Swath width ~650 km
- Incidence angles
 - 20° to 53.7° (mid beams)
 - 28.4° to 65° (side beams)
- Polarizations: VV plus HH + HV + VH on mid-beams for improved high winds retrieval





EPS-SG SCA processing chain and products

www.eumetsat.int



EUMETSAT internal products

EUMETSAT HQ

EUMETSAT SAF network:
OSI SAF + H SAF



Product ID	Global / Regional	EUMETCAST	Others	Destination (Others)	Archive
SCA-1B-SZF	G		NetCDF-4	KNMI	BUFR NetCDF-4
SCA-1B-SZR	G	BUFR NetCDF-4			BUFR NetCDF-4
SCA-1B-SZF	R		NetCDF-4	KNMI	BUFR NetCDF-4
SCA-1B-SZR	R	BUFR NetCDF-4			BUFR NetCDF-4

Timeliness

- Global data: target 70 min
- Regional data: target 30 min

Some updates expected.

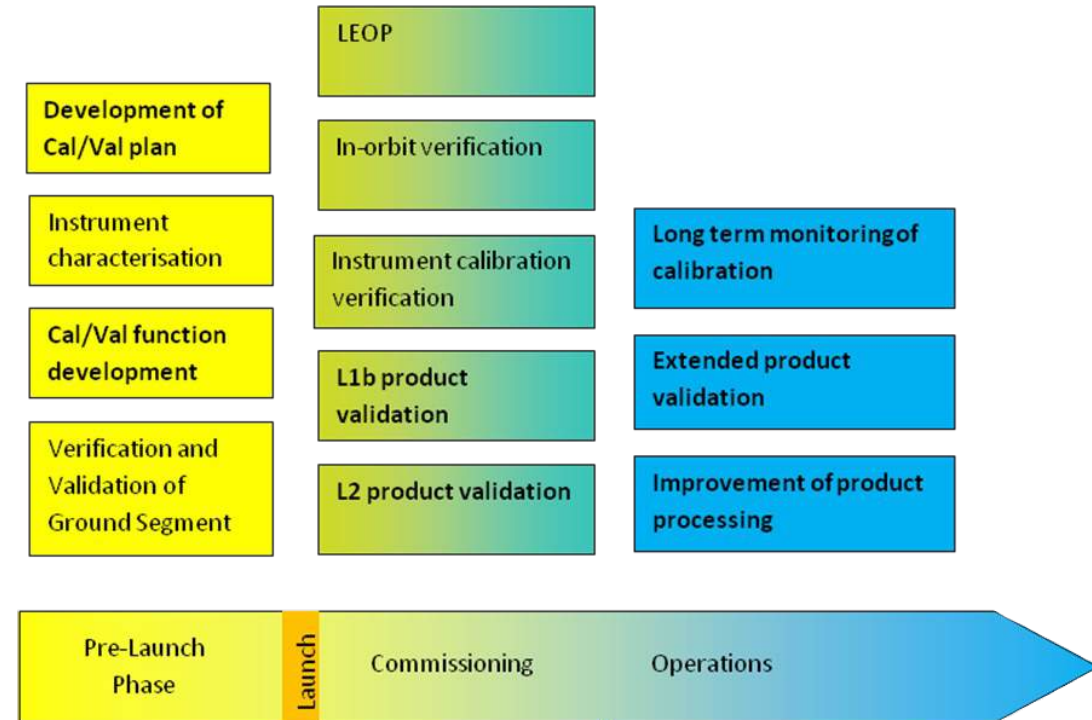
No dissemination via GTS is currently planned for SCA L1B data.



SCA summary and outlook

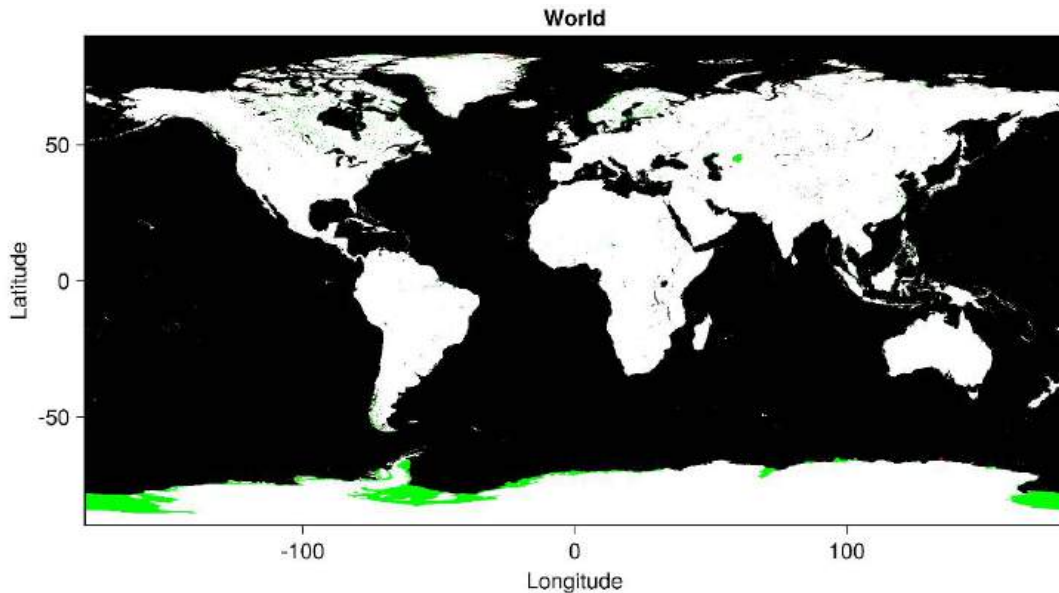
SCA will ensure continuity of the EUMETSAT scatterometer missions for a period of >> 30 years

- Currently preparing cal/val activities and supporting the development of the operational processing facilities
- Finished final pre-launch versions of processing specs, test data set and cal/val plan
- SCA cal/val will follow the well-established approach used for ASCAT:
 - Validation using natural targets to assess long-term stability
 - Ground-based transponders as absolute reference



Ongoing activities

- Reprocessing the full ASCAT-A mission to provide a consistent time series of the full mission duration
- Small evolution of the L1 processor – introduction of a new land-sea mask (fix known issues with the current one, is now consistent with the one for SCA)



Upcoming

- Will continue with ASCAT-B and ASCAT-C long-term behaviour assessment and reprocessing
- Investigate noise/RFI evolution – this is highly problematic for land applications

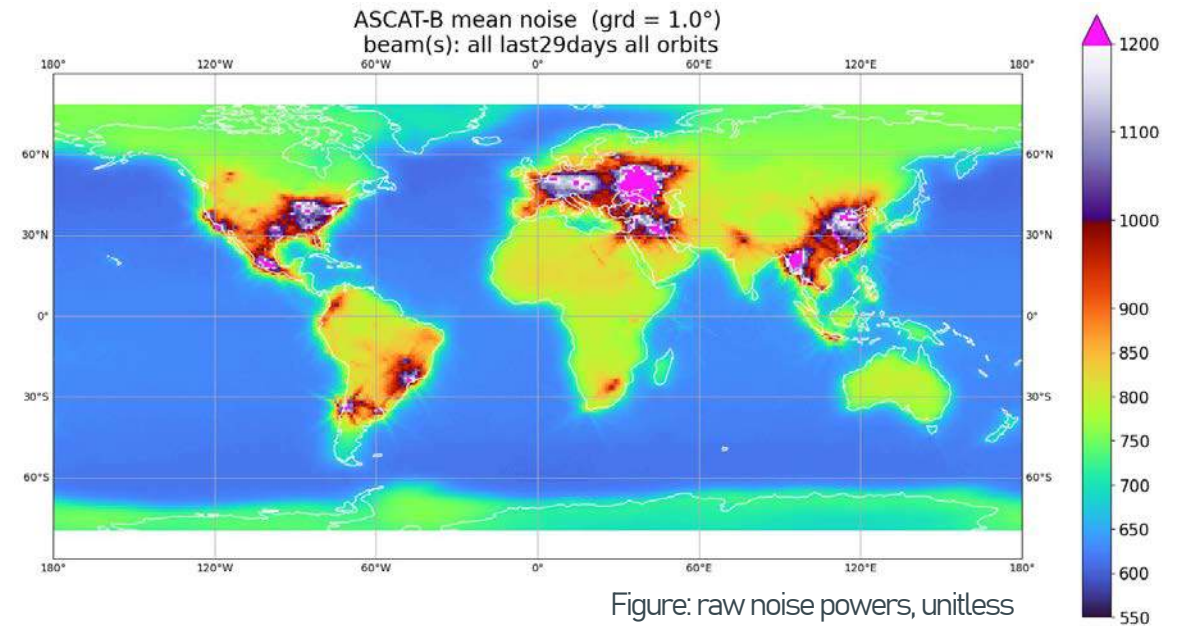
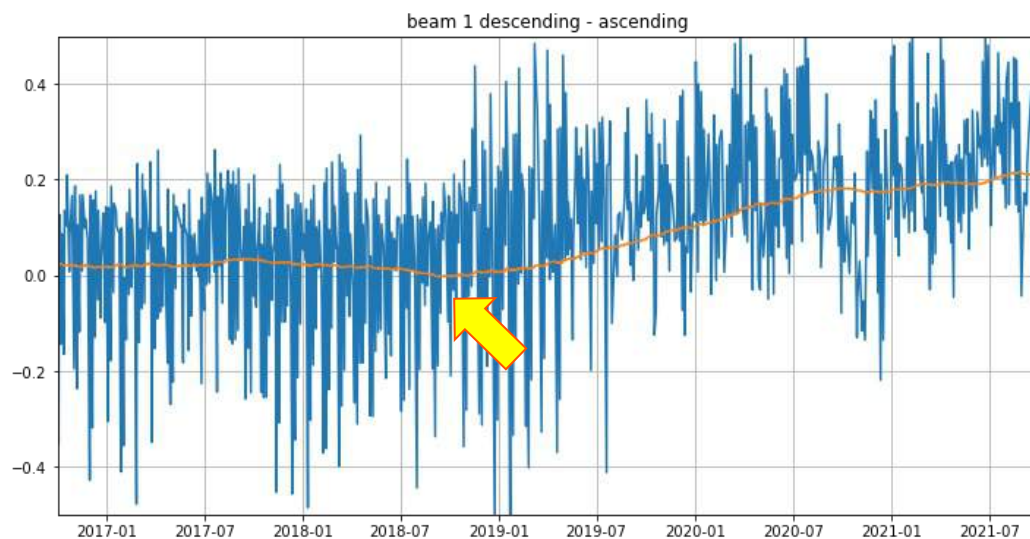


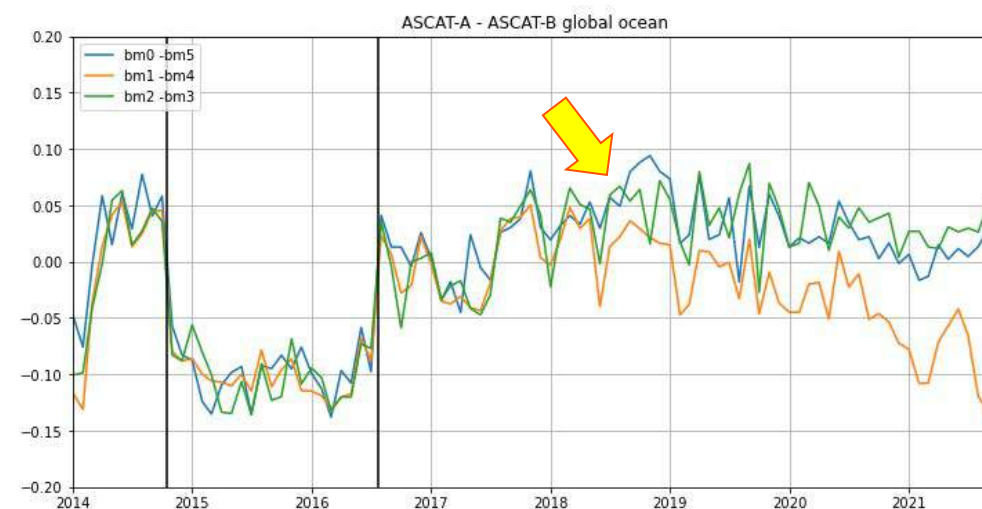
Figure: raw noise powers, unitless

Amazon rainforest



- Difference between the Gamma-0 obtained from descending and ascending orbits over the rainforest
- Discrepancy between ascending and descending orbits, starting around 2019
- Drift documented by Ricciardulli et al.* starts around the same time

Global ocean



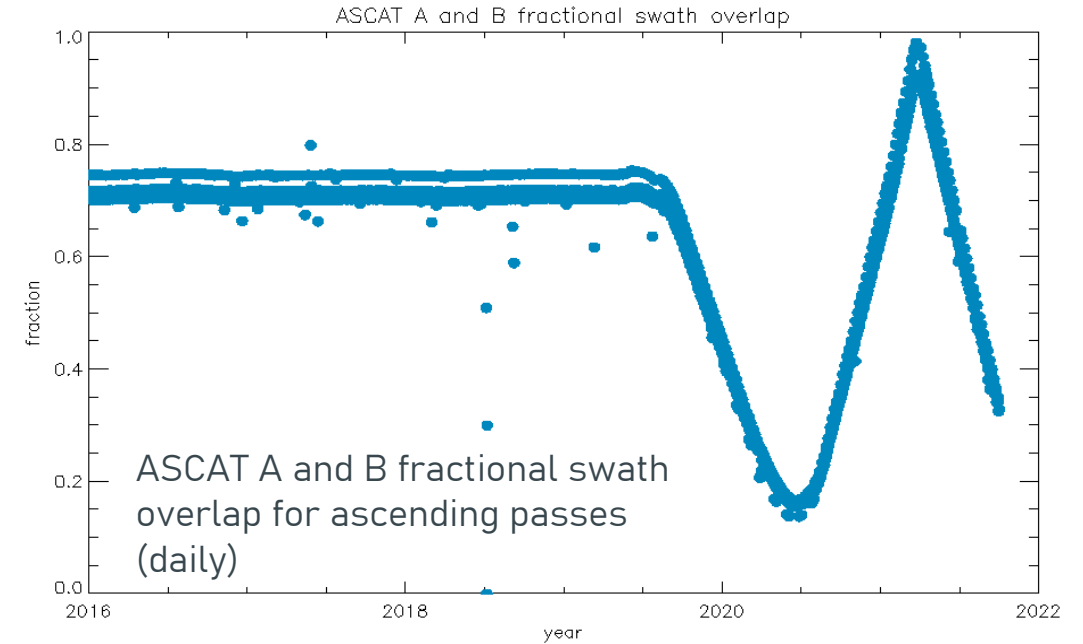
- Similar trend in the differences between the opposing beams
- Also here, different spatial sampling of ASCAT-A and ASCAT-B

* A Stable Satellite Wind Climate Data Record for Climate Variability Studies, Lucrezia Ricciardulli, Andrew Manaster, Thomas Meissner, and Carl Mears, Remote Sensing Systems, Santa Rosa, CA, USA, IOVWST 2023

ASCAT-A ground track

The last inclination maintenance of ASCAT-A occurred on 31.08.2016

- after that, a slow drift has started leading to the local time of the ascending node to be shifted to about 90 minutes earlier by the end of the mission i.e., ~ 20:00 for ascending and ~08:00 for descending orbits.



Drift observed since 2018 is most likely caused by different spatial sampling due to the drifting ground track of ASCAT-A, and is not a calibration issue



Thank you!
Questions are welcome.