EPS-SG SCA Cal / Val preparation

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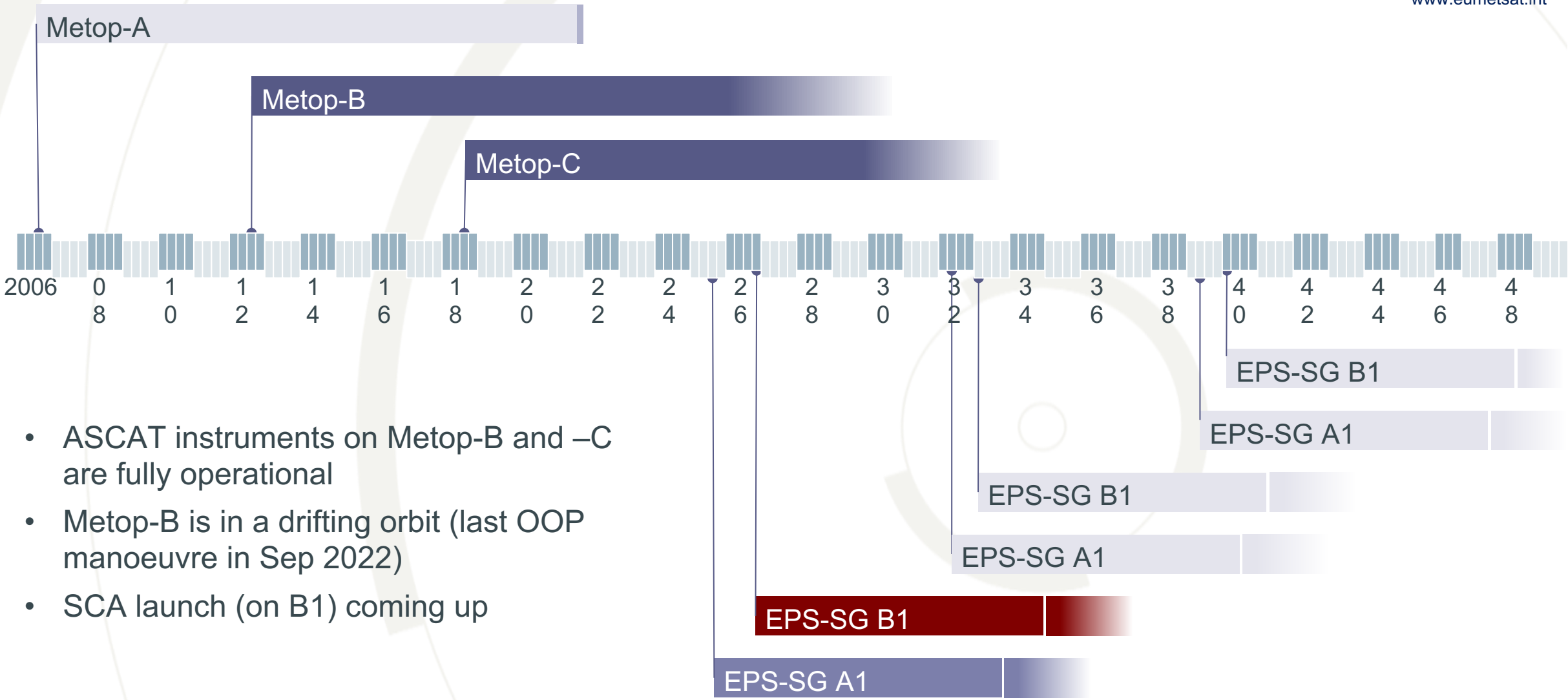
Agenda

Overview and schedule

Intercalibration using natural targets

EUM scatterometer missions



- ASCAT instruments on Metop-B and –C are fully operational
- Metop-B is in a drifting orbit (last OOP manoeuvre in Sep 2022)
- SCA launch (on B1) coming up

Commissioning timeline

Launch

SIOV

- 3 months duration
- Assessment of the instrument functions by industry

Level-1 Cal/Val phase

- Baseline duration 3 months
- EUM assessment of the quality of the science data
- Monitoring of the instrument reference functions
- Calibration of the L1 data
- Validation of calibration results using natural targets
- Trial dissemination to selected core users (SAF partners)

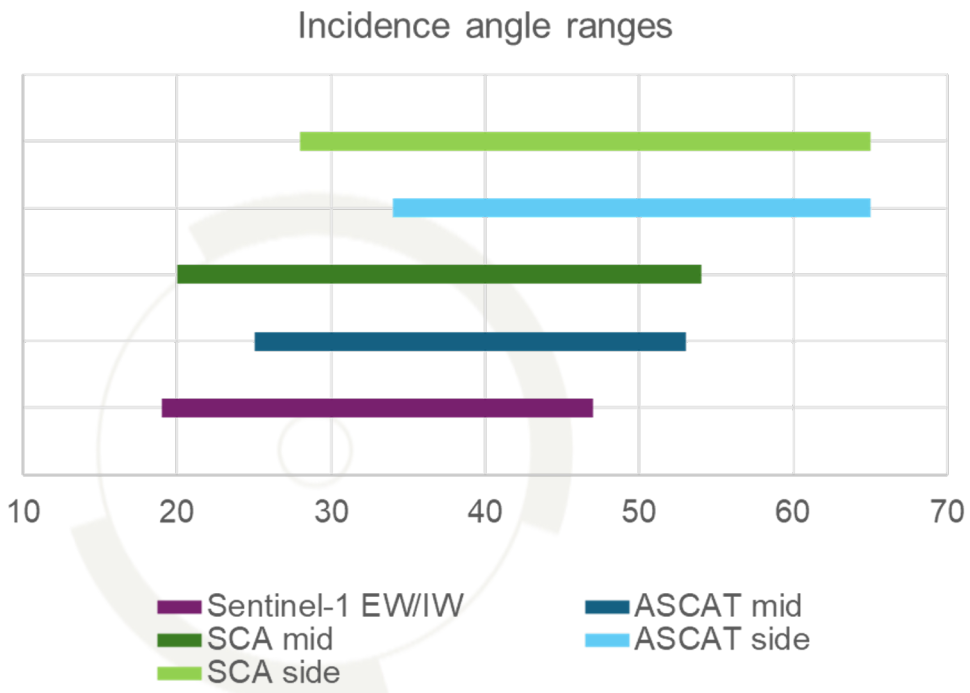
Level-2 Cal / Val (SAF partners)…

Operational dissemination of Level-1 products

Day-2 updates …

Preparation work – cross-calibration

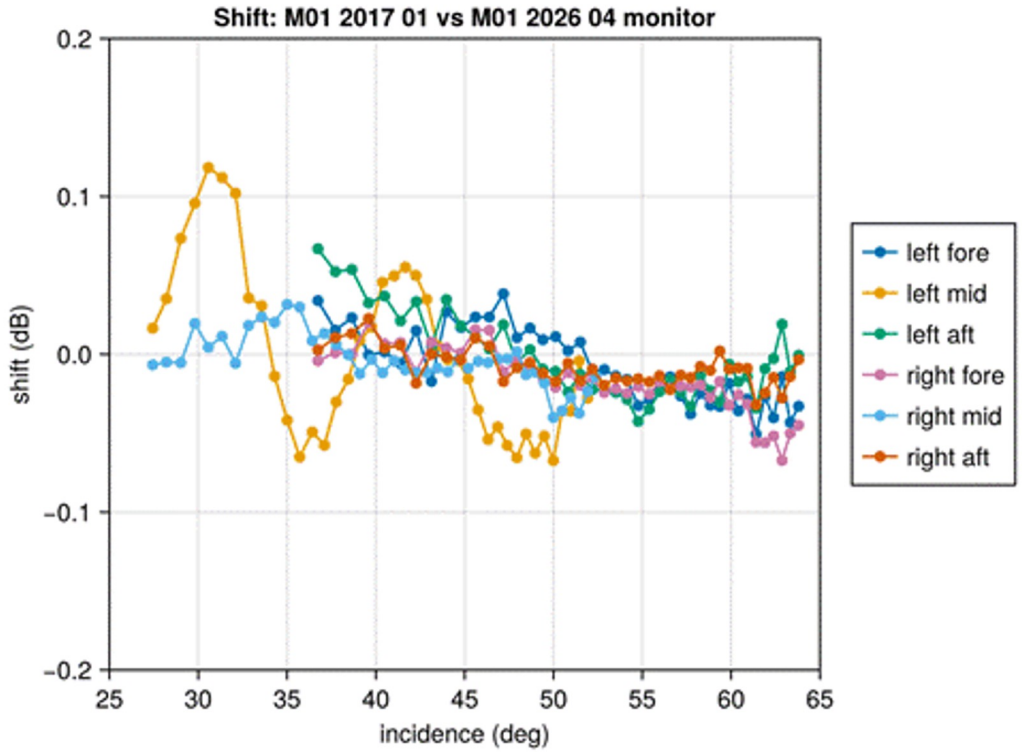
- Default approach for the initial calibration uses the Amazon rainforest
- Direct comparison with ASCAT is possible within the same **incidence angle range** and the VV beams
- Need to find approach for the **HH channel**
- **Cross-pol** channel calibration: linear combination of HH and VV antenna gain patterns
- Geolocation accuracy requirement of 1 km can be verified with at least one transponder



ASCAT calibration assessment

ASCAT-B calibration update

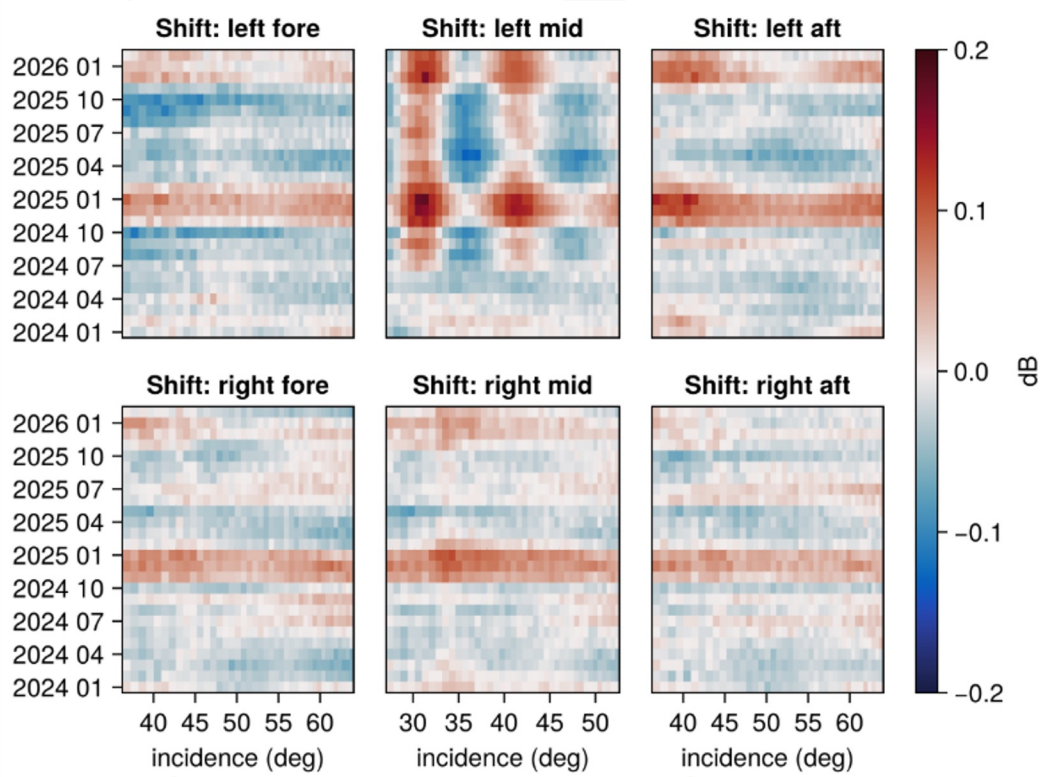
- Anomaly (across-swath oscillation) in left mid beam on ASCAT-B since June 2024
- Need the antenna pattern update for the initial cross-calibration between ASCAT and SCA
- Correction has been developed, this is based on the ocean cone

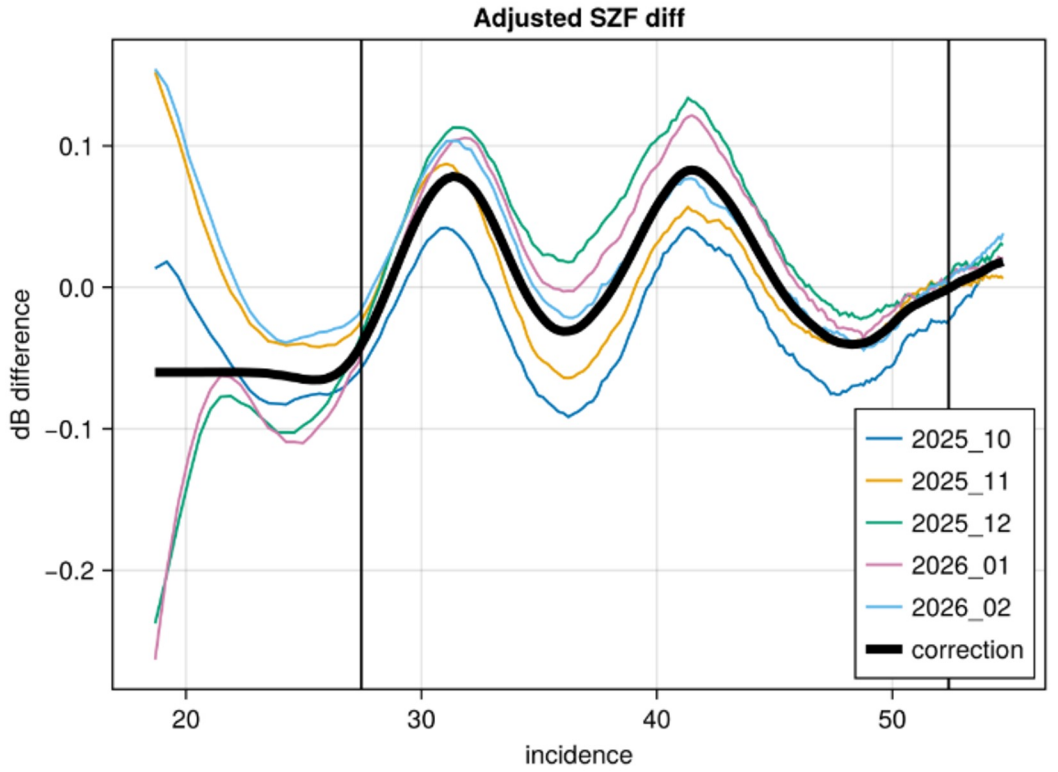


Cone metrics comparison between ASCAT-B (2017) and ASCAT-B (April 2026)

ASCAT B – left mid beam oscillation

- The location of the oscillation is stable
- Mean ocean backscatter is used to extend the comparison to full resolution
- Empirical correction to the ASCAT-B gain pattern
- To be deployed in operational ASCAT-B processing chain on 19 June 2026





Preparation work – natural targets

Cross-calibration using natural targets

1. Cross-calibrate VV channel to ASCAT using rainforest data
2. Validation of σ^0_{VV} using ocean cone
3. Apply polarisation model to map VV to HH
4. Then, σ^0_{HV} and σ^0_{VH} are just linear combination of σ^0_{VV} and σ^0_{HH}
5. Cross-check of σ^0_{VV}, σ^0_{HH}, σ^0_{HV} and σ^0_{VH} using rainforest SAR data (include VV here to cover the full incidence angle range)

Rainforest stability

Analysing the variability within the ROI used for validation.
Relative backscatter values are generated for each grid cell:

$$\Delta\gamma = \gamma_t^0 - \bar{\gamma}^0$$

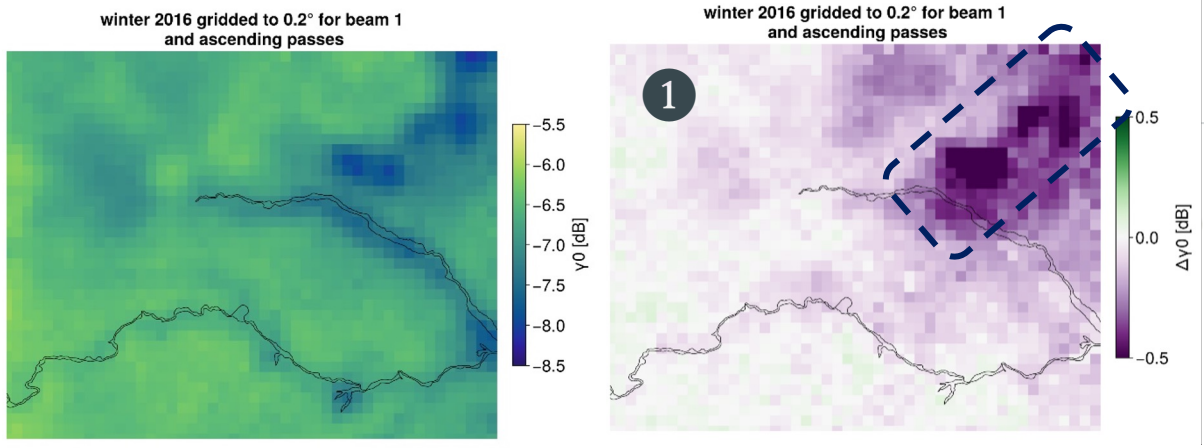
γ_t^0 is a seasonal mean

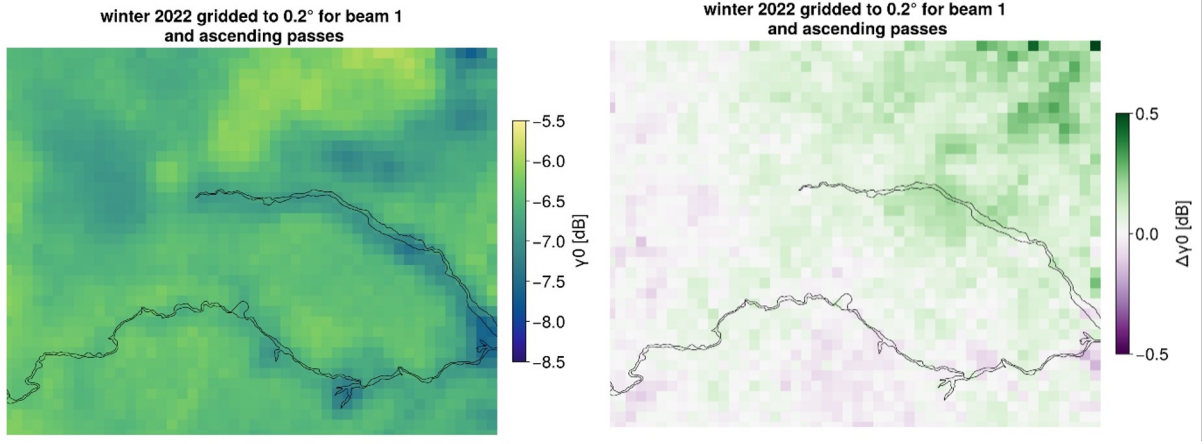
$\bar{\gamma}^0$ is the average value over the full ASCAT-B time series

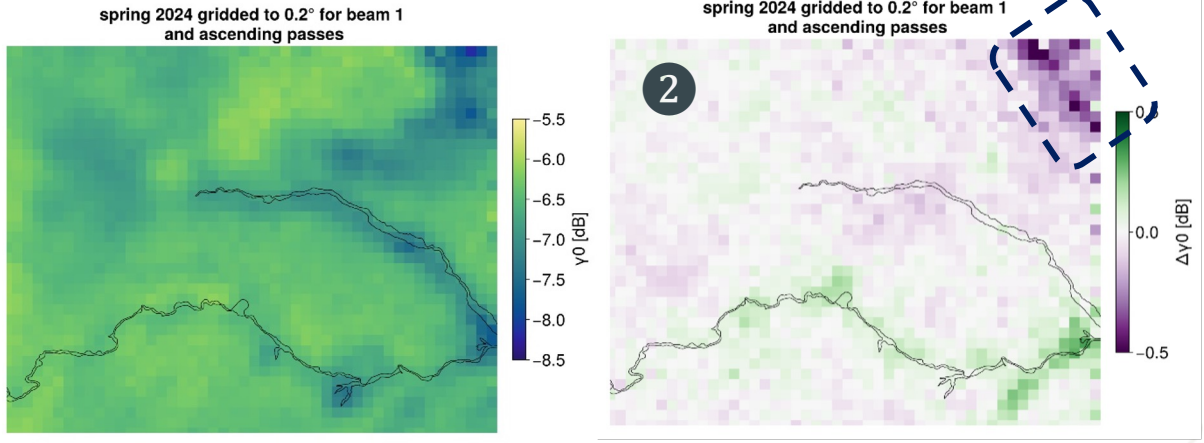
1. Sub-region with larger variability in the NE corner has different vegetation type, with larger impact of 2015/16 drought.
2. Possibly deforestation / land cover change?

Sub-region is more variable, and this will impact the statistics of the entire box

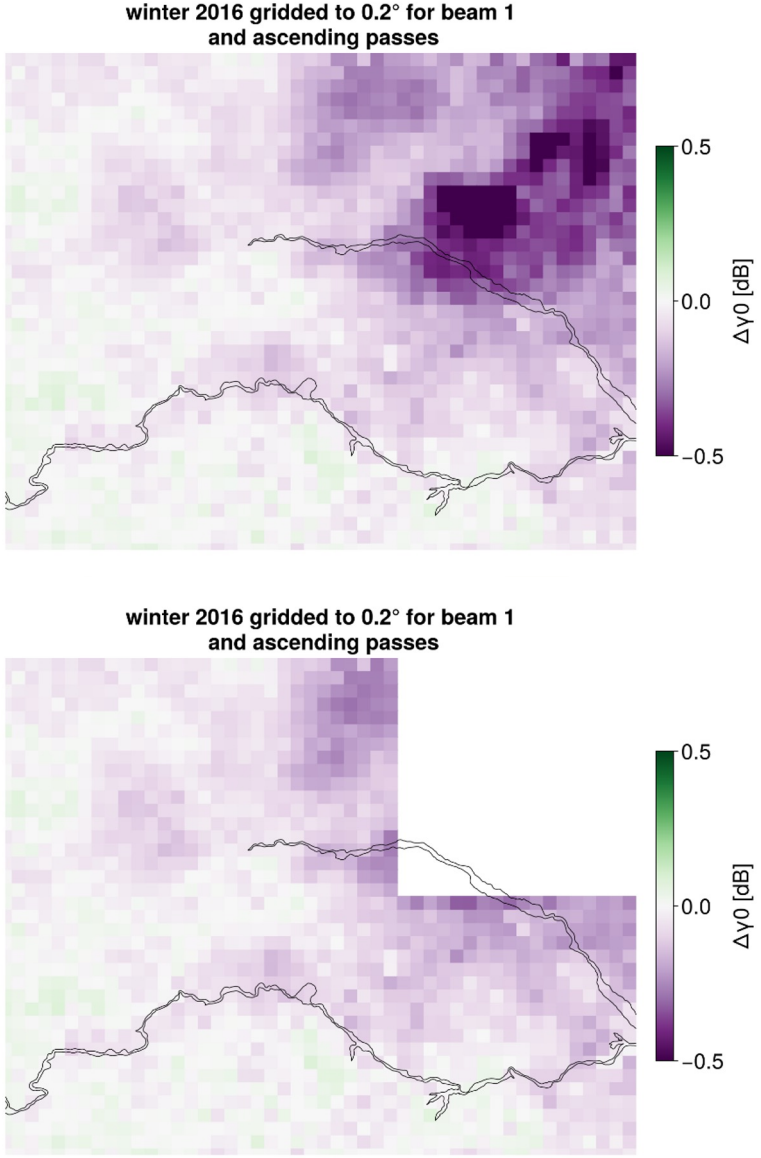
→ **reconsider ROI definition**

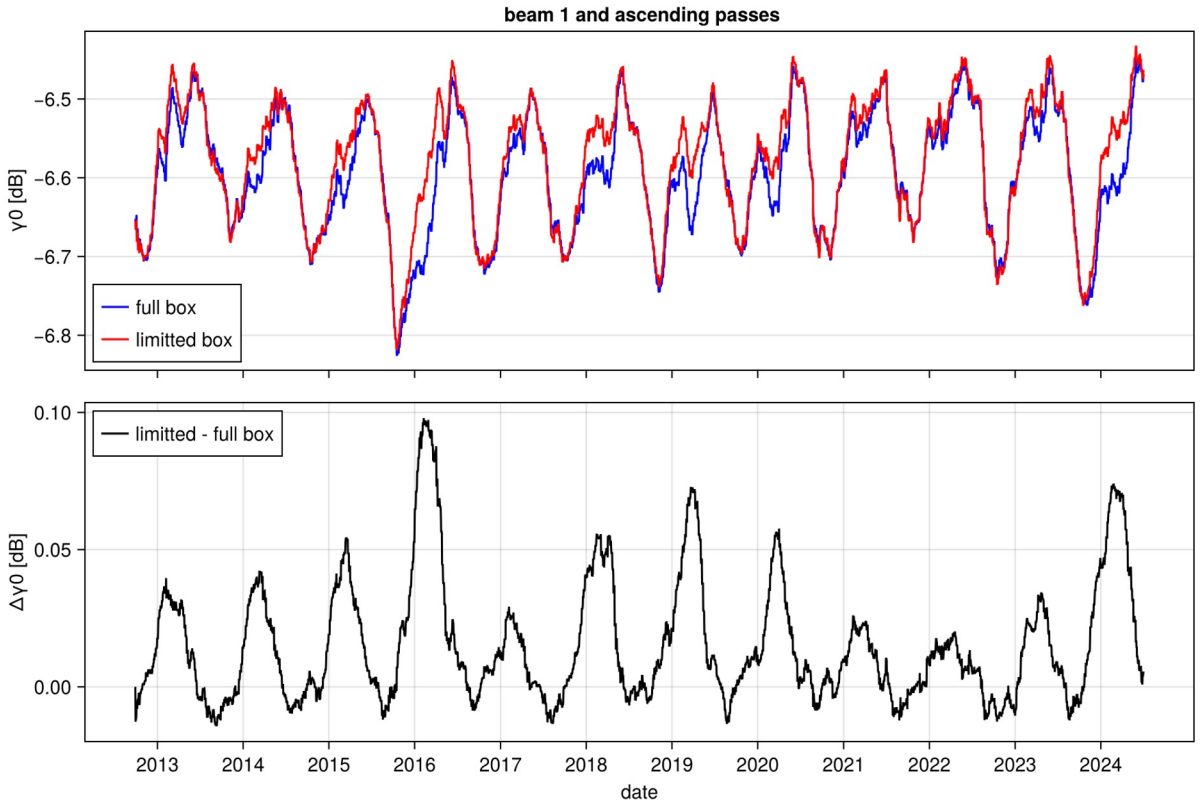






Rainforest stability



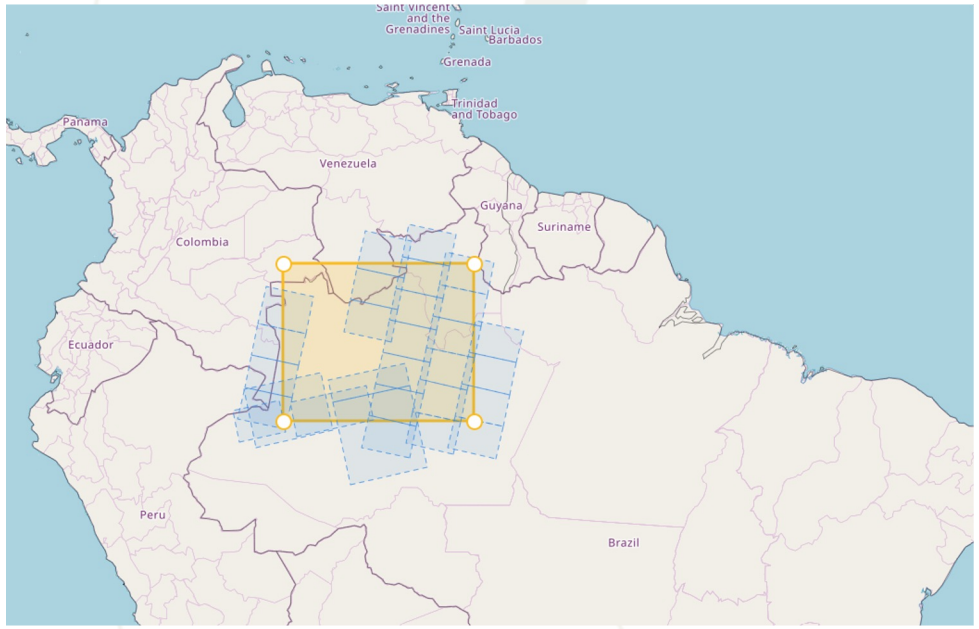


ASCAT-B 29-day averages of γ^0 over the rainforest Cal/Val site before and after removing the north-east part which has a different vegetation type

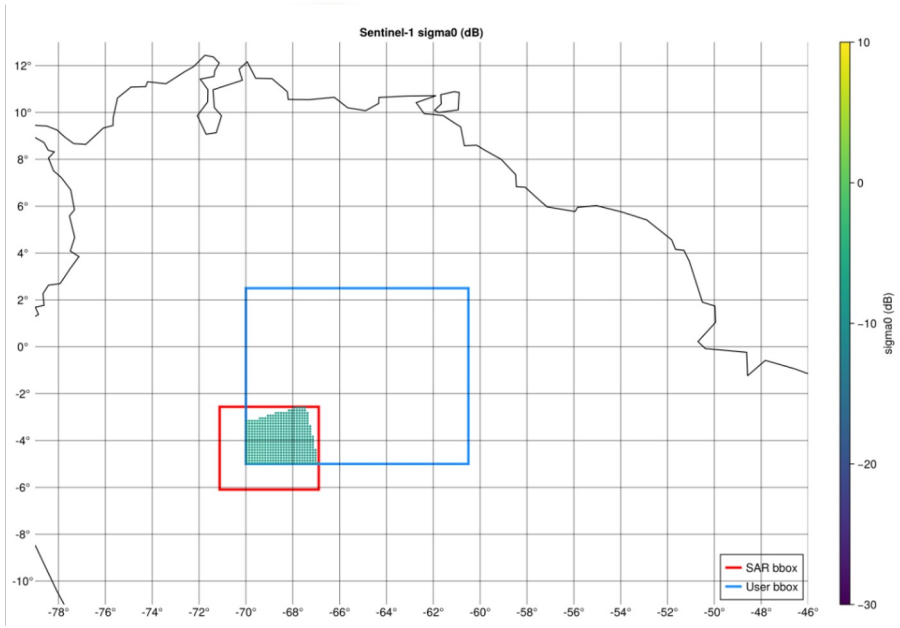
SCA Level 1B validation using Sentinel-1

Stable natural targets to assess the **radiometric bias, stability and inter-beam consistency** of SCA Level 1B σ^0 measurements

- Aggregate measurements by incidence angle, beam, swath and polarisation.
- Compare ASCAT / SCA and SAR σ^0 in different polarisations
- Monitor statistics during commissioning



SAR Data available in selected region over the rainforest



Selected measurement points (backscatter, incidence angle) in a unified grid (example subset).

Thank you!

Questions are welcome.