

Status overview of the European scatterometer activities

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Current and future European operational scatterometer missions

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, HH + HV + VH on mid-beams for improved high winds retrieval







Current and future European operational scatterometer missions



Metop

- ASCAT-A (launched 19 October 2006), ASCAT-B (launched 17 September 2012), ASCAT-C (launched 07 November 2018)
- All three operational
- ASCAT-C operational since 02 April 2019

Metop-SG

- Scatterometer instruments SCA are on SAT-B
- Sat-A launch planned for November 2022
- Sat-B launch re-baselining ongoing

Metop orbit phasing



Current configuration

- Metop-C in Tristar ٠
- Metop-A drifting toward • Trident

Final configuration

to be implemented after • commissioning

ASCAT-C cal / val

Cross-calibration with ASCAT-A/B

- $\gamma_0 = \sigma_0 / \cos(\theta)$ stable over rainforest areas
- Cross-calibration using ASCAT-A and –B based on several weeks of rainforest data
- Initial gain pattern updated on 22 Jan 2019
- Refinement after geolocation correction, update installed on 26 Feb 2019





Ocean validation



MetOp

ASCAT-C inter-beam calibration

- Time series, 15 26 Feb 2019, open ocean data
- Compare beam pairs with 180° separation
 - Beams 0 and 5: 0.1 dB
 - Beams 1 and 4: 0.03 dB
 - Beams 2 and 3: 0.03 dB
- Relative interbeam calibration in each pair is accurate

Comparison between all ASCAT instruments

• Average difference between ASCAT-C and...

Beam	ASCAT-A	ASCAT-B
0	0.03	-0.06
1	0.02	-0.10
2	0.01	-0.24
3	-0.13	-0.09
4	0.03	-0.15
5	0.09	0.04



Summary – ASCAT C

- We have performed the activities described in the ASCAT-C cal/val plan
- No major issues were found
- Initial cross-calibration with ASCAT-A and B is based on data from the Amazon rainforest.
- Some problems were found in the transponder data, but it could still be used to improve the antenna pointing.
- The radiometric calibration of ASCAT-C is based on the cross-calibration to ASCAT-A/B.
- The external calibration will be re-attempted after the new transponders are installed in the second half of 2019
- Operational since 2 April 2019

Some links

SCA Science Plan

ASCAT-C Commissioning Report



Status of ASCAT operations





Metop-SG SCA

Instrument

- SCA CDR was successfully held in April 2019
- Satellite B CDR to be held in Q4 2019



Products

- The Level 1b products will contain VV, HH and cross-pol backscatter, land contamination ratio (LCR) and a Faraday contamination ratio
- Details: see poster



Metop-SG SCA

Processor development

- First version of the Cal/Val Plan under internal review
- Completion of the **processing specs** is ongoing
- Processor prototype and operational processor are under development
- **Development and testing of the operational processor** will be based on test data created using the prototype
- End-to-end testing of the SCA operational processor in the ground segment will be based on 3 orbits of level 0 (and reference level 1b) data produced by the prototype
- The data sets will cover a range of nominal and non-nominal situations (e.g. data gaps, data out of limits, RFI etc.)



- (a) Echo signal power in the left mid vv beam (IDS)
- (b) Power spectra, left mid vv beam



Outlook

Metop / ASCAT

- L1 processor update:
 - Clean-up of the product flags, inclusion of LCR
 - Release preparation ongoing
 - Test data available (L1 format change)
- New transponders should become available in Q2/2019

Metop-SG / SCA

- Development of instrument, processors and specs is ongoing, progress nominal
- Re-baselining of Sat-B is ongoing

