Copernicus Sentinel-4 and Sentinel-5 - update from EUMETSAT

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Agenda

Sentinel-4 and Sentinel-5 on MTG and EPS-SG
ESA and EUM roles

EUMETSAT activities
Ground segment
Operations preparation
User preparation

Cal/Val
Objectives
Announcement of Opportunity
Copernicus Sentinel-4 and Sentinel-5

- MTG and EPS-SG systems provide a synergistic suite of instruments
  - Sentinel-4, IRS (IR spectra), FCI (clouds; high spatiotemporal sampling)
  - Sentinel-5, IASI-NG (IR spectra), MetImage (clouds, high spatial sampling), 3MI (aerosols)

- Anticipated launch dates for both MTG-S1 and EPS-SG-A1, as of today, are in the first half of 2025.
Sentinel 4 responsibilities - Detail

Requirements Definition Process

- Instrument development (Airbus)
- Prototype processor development (L1&L2)
- Evaluation and handling of NCRs/RfDs
- Quality acceptance

- Reference processor development
- CKD calculation
- Operational processor development (L1)
- Commissioning & Cal/Val
- Launch

- Operational processor development (L2)

- In-orbit acceptance
- Operation and in-orbit calibration

- Mission Cal/Val & scientific product evolution
- User preparation
- L1 & L2 Data distribution
Sentinel 5 responsibilities - Detail

- Instrument development (Airbus)
- Prototype processor development (L1 & L2)
- On-ground C&C campaign
- Quality acceptance
- CKD calculation
- Commissioning & Cal/Val
- Requirements Definition Process
- Reference processor development
- Evaluation and handling of NCRs/RfDs
- Operational processor development (L1 & L2)
- In-orbit acceptance
- Operation and in-orbit calibration
- User preparation
- L1 & L2 Data distribution
- Mission Cal/Val & scientific product evolution
EUMETSAT activities

The main focal points are on

1. following instrument calibration campaigns, conducted by ESA/industry, and instrument acceptance processes.

2. ensuring the readiness of the data processing systems through
   - Implementation and integration of reference processor solutions for early mission data processing and support of Cal/Val activities.
   - Development, integration & verification of the operational processors in the ground segments for routine operations.

3. Preparation of Cal/Val activities
   - Development and procurement of tools for in-house Cal/Val
   - Setting up of external support services
   - Preparation of Announcement of Opportunity for Support of Cal/Val

4. User preparation
   - Coordination WG with CAMS
   - Webinars, workshops & schools in partnership with ESA & ECMWF
Sentinel-4 & Sentinel-5 Cal/Val – a joint effort

Objectives

A. Assess and establish initial post-launch data quality of mission products
B. Support consolidation of processors by identifying and fixing bugs in algorithms and processor implementations, by providing a basis for the fine-tuning of algorithm settings, and by identifying and handling potential unexpected post-launch instrument features
C. Verify that mission products meet performance requirements and can be released to the users
D. Monitor data quality on long-term operational basis. Support maintenance and evolution of processors throughout mission lifetime

Announcement of Opportunity to trigger & coordinate nationally funded Cal/Val activities

• Aiming at Objectives A), B), C)
• Complementing planned commissioning phase activities verifying PFM instruments, L1b and L2
• Complementing long-term Cal/Val activities by EUMETSAT aiming at Objective D)
Announcement of Opportunity Call

• Joint Call by ESA and EUMETSAT, ~1 year before launch of first PFM (S4 or S5) → first half of 2024

• Builds on
  • CEOS AC-VC & WGCV Whitepaper “Geostationary Satellite Constellation for Observing Global Air Quality: Geophysical Validation Needs” Oct 2019
  • Parent doc = Sentinel-4 and Sentinel-5 Cal/Val Plan, jointly prepared by ESA and EUMETSAT, v2 (under prep)

• Combined Call for S4 and S5, split only in case launches drift >1 year apart

• Joint scientific committee for gap analysis and coordination (to balance proposed activities with needs).

• Organisation of a Cal/Val prep workshop, ~1/2 year prior to the first launch

• Series of Cal/Val review workshops starting during commissioning
Thank you!
Questions are welcome.