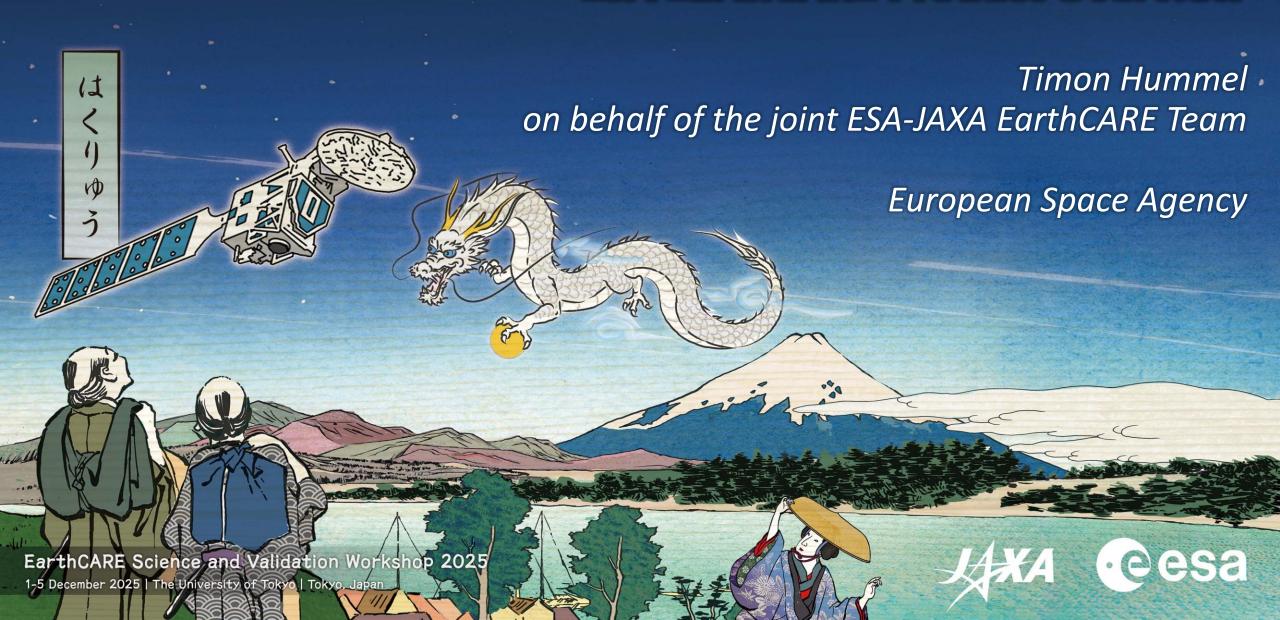
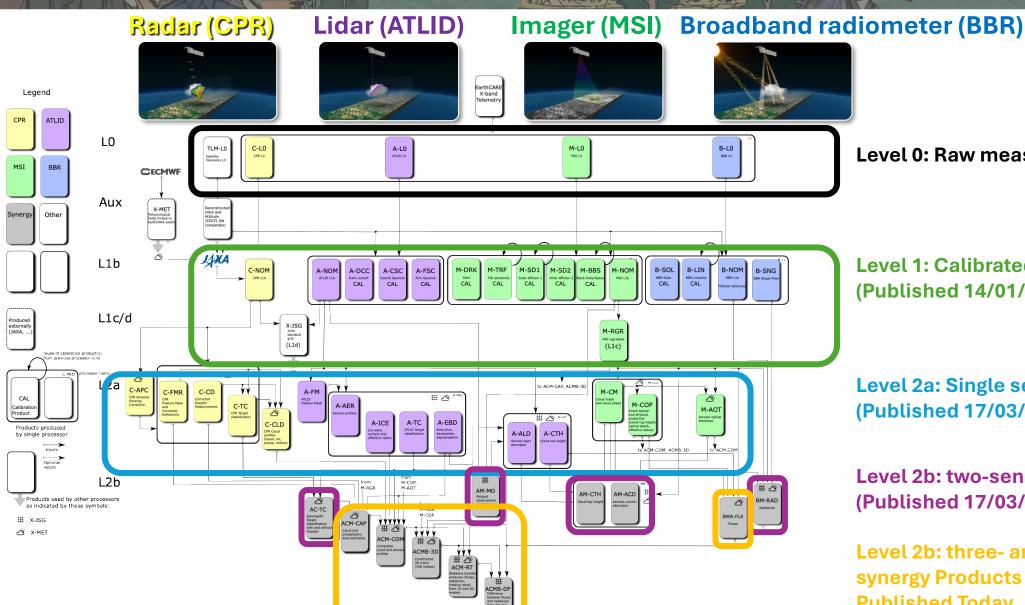
### **ESA EarthCARE Product Overview**



# **EarthCARE Production Model**





Level 0: Raw measurements

Level 1: Calibrated Instrument Data (Published 14/01/2025)

**Level 2a: Single sensor Products** (Published 17/03/2025)

Level 2b: two-sensor synergy Products (Published 17/03/2025)

Level 2b: three- and four-sensor synergy Products **Published Today** 

# EarthCARE DISC































## **Product Overview Highlights**



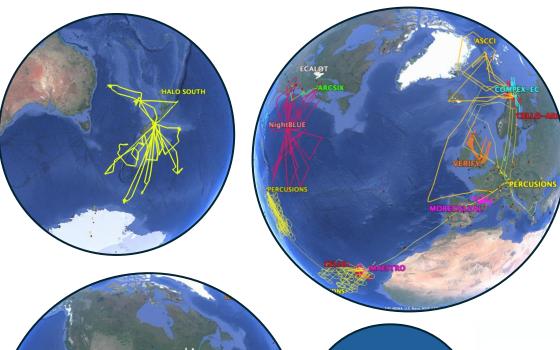
- **Full Mission Reprocessing** of the *BA baseline* is now available across the complete ESA product suite, including todays released three- and four-sensor products.
- **Newer processing baselines** are already operational in forward mode.
- **High data product maturity**, achieved despite the complexity and ambition of EarthCARE:
  - ✓ Intensive processor evolution cycles (< 100 processor updates).
  - ✓ Extensive validation activities (< 100 EarthCARE underflights).
    </p>
  - ✓ Strong User Demand (< 9.5 Million files OADS + MAAP downloads)
    </p>

Product Type	# Products [million]	Volume [TB]
ESA L1 and CPR L1B	2.970	403
ESA L2	6.412	123
JAXA L2	0.386	14

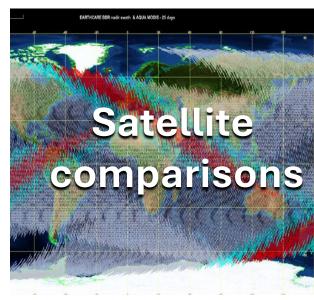
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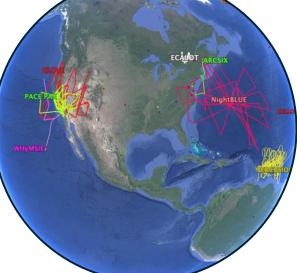
# Validation approaches



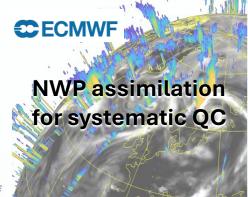








127
Underflights
Remote
sensing and
in situ









# Validation evolution/outlook



**Annual Workshops Next workshop:** 08-12 June 2026, Oxford, United Kingdom.

Continuation of regular thematic subgroups and **ECVT Confluence and** Forum (no changes)

**Planning** Reporting Correlative Discussions Data handling Q&A Validation Workflow **Expanding repository EarthCARE** Comparison data discovery Analysis & Download

Mission Analysis overpass predictions: No major changes

**OPOT:** improving prediction quality

> EVDC interface 'routine' evolution

Campaign datasets: facilitation of discovery/exploitation

Transition from OADS to MAAP (10x faster)

Further reprocessing cycles

with tools. Adaptations to tools to enable running on MAAP

## 1st Full-Mission Reprocessing campaign



### First Reprocessing Campaign completed early November (duration: 5 months)

- Processed ~1.3 million L1 and L2 products
- Involved 3 different entities:
  - CPF: 320 cores for L1 products
  - Generic reprocessing service DAMPS: 400 cores for L2 products (excluding ACM-RT & ACMB-DF)
  - ECCC Canada: 5000 cores for ACM-RT & ACMB-DF
  - Additional tasks:
    - ✓ In-flight calibration data reprocessing
    - ✓ Quality control
    - ✓ Data transfers & ingestion into dissemination servers

### 2nd Reprocessing Campaign Planning: Spring 2026 IIII

- Second full-mission reprocessing campaign
- Speed up processing with fewer transfers
- Process in batches (months of sensing) with parallelization of steps
- Target: 2 weeks of data (2WDs) per month of sensing + initial reprocessing pipeline setup

## **BBR intermittent Operations**



#### **Motivation for Change**

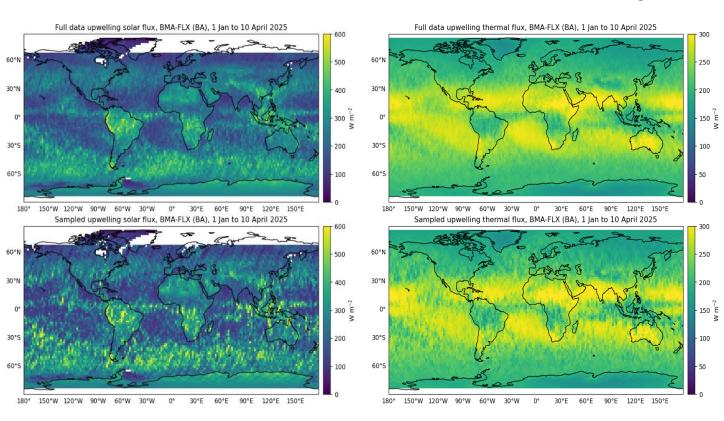
- Mission analysis indicates EarthCARE potential to <u>exceed 10 years</u>, but the BBR Chopper Drum Mechanism (CDM) is life-limited to ~3 years under current operations.
- Strategy shifts focus to extending time series coverage rather than maximizing continuous data.

#### **Operational Concept:**

- Intermittent Operations: Implements a cycle of 5 days in 'Nominal' mode followed by 15 days in 'Stand-by'.
- Rationale: This 20-day cadence creates a 100-day repeat cycle, ensuring statistically accurate spatial and temporal sampling while preserving mechanism health.

### Flexibility:

 Includes 'Ad-hoc' activation capabilities during 'Standby' phases to capture unforeseen events (e.g., volcanic eruptions, dust outbreaks) or support validation campaigns. Credits: Jason Cole, Nicolas Clerbaux, Robin Hogan, et.al



- Full EarthCARE ESA products suite have been released to the users:
  - Level-1: 14/01/2025
  - Level-2a + two-sensor Level-2b synergy: 17/03/2025
  - Three- and four-sensor L2b synergy procuts: **Today!**
- Very promising product quality and offering significant scientific opportunities.
- EarthCARE Data innovation and Science Cluster (DISC) continues to ...
  - Monitor the product quality and provide regular reports to users
  - Continuously enhance the quality of existing processors and products, building on the valuable findings and recommendations of the Validation Teams.
  - Provide User support