JAXA EarthCARE products

Takuji Kubota
Earth Observation Research Center (EORC),
Japan Aerospace Exploration Agency (JAXA)

1st ESA-JAXA EarthCARE In-Orbit Validation Workshop
14 – 17 January 2025 | VIRTUAL EVENT

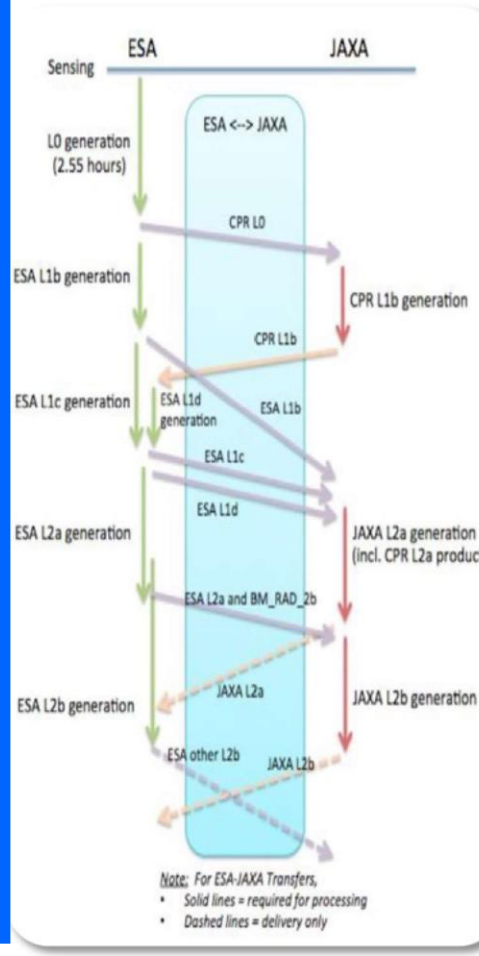
EarthCARE data products are generated by ESA and JAXA

Covered in previous presentation

ATLID	BBR	MSI	CPR
L1	L1	L1	
L2A		L2A	L2A
L2B			

Covered in this presentation

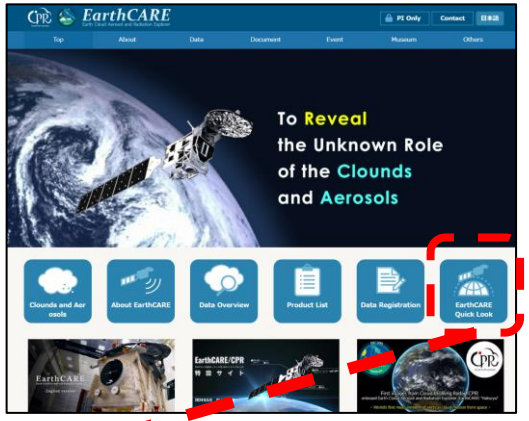
ATLID	BBR	MSI	CPR
			L1
L2A		L2A	L2A
L2B			

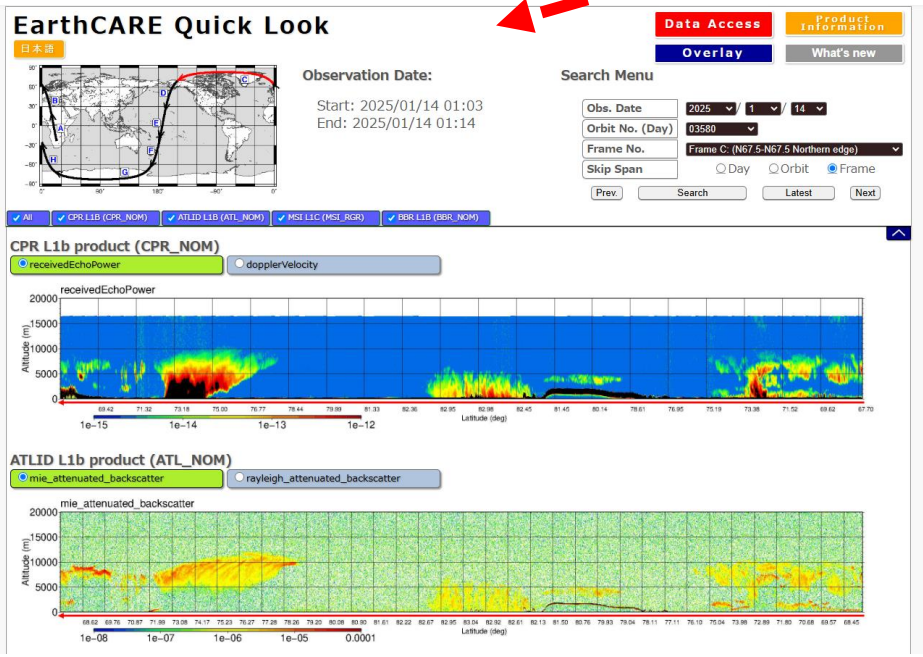


EarthCARE JAXA Product

- Level 1 products have been developed by sensor provider agencies.
  - ✓ i.e. JAXA has developed CPR Level 1 product
- JAXA and ESA have developed Level 2 geophysical products individually, and continuous exchange of information is being conducted between Japan and Europe scientists.
- JAXA and ESA Level-2 products will be distributed by both agencies.
  - ➢ Single-sensor Level-2a products and 2-sensor Level 2b products: Public release target date: March 2025
  - ➢ 3-sensor/4-seonsor Level 2b products: Public release target date: Nov.-Dec 2025

JAXA/EORC EarthCARE homepage summarizes product information and provides EarthCARE "Quick Look" images.
https://www.eorc.jaxa.jp/EARTHCARE/index.html





https://www.eorc.jaxa.jp/EARTHCARE/Quicklook/index.html

JAXA CPR Level 1 Processor Status

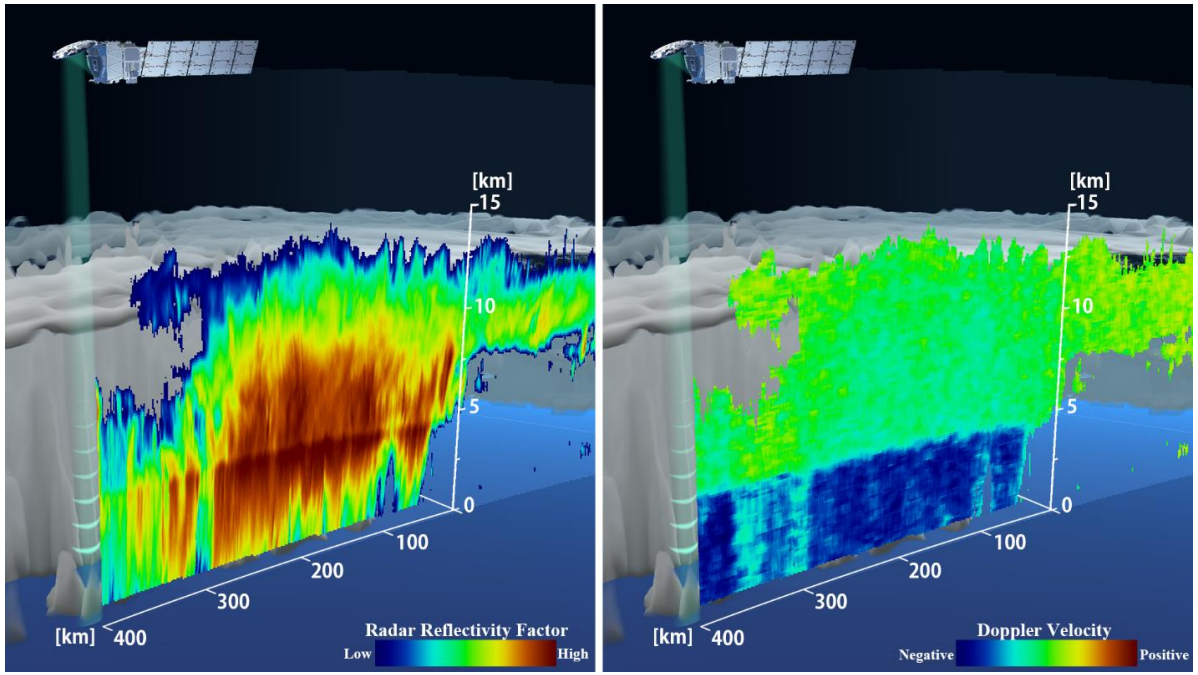
- In CPR level 1b products, received echo power, radar reflectivity factor, Doppler velocity, spectrum width, normalized surface scattering cross section, and data flag are included.
  - The CPR Level 0 data is delivered from ESA PDGS to JAXA's EarthCARE mission operation system (MOS).
  - This is then processed by CPR level 1b processor which turns the raw data in engineering units into calibrated parameters, such as received echo power and Doppler velocity, stored in level 1b data products. Geolocations, quality information, and error descriptors are added to the level 1b products as well.

✓ Please join CPR session held in Day 2 (Wed., 15 January) and/or CPR summary session in Day 4 (Fri., 17 January).

CPR first image released in June 2024

CPR L1b Radar reflectivity factor profile

CPR L1b Doppler velocity profile



https://global.jaxa.jp/press/2024/06/20240627-1_e.html
https://www.nict.go.jp/en/press/2024/06/27-1.html
https://www.esa.int/Applications/Observing_the_Earth/FutureEO/EarthCARE/A_first_EarthCARE_reveals_inner_secrets_of_clouds

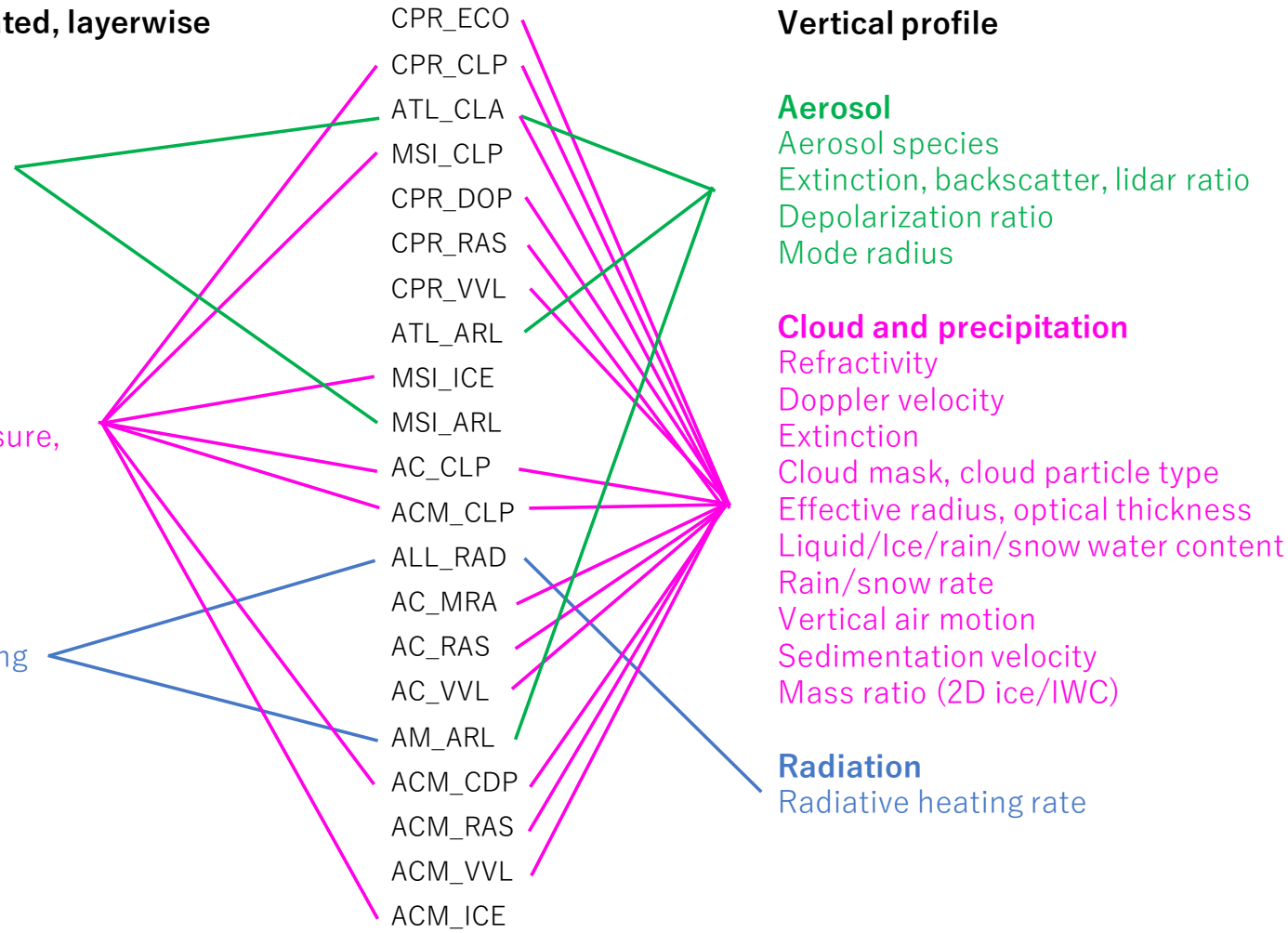
Overview of JAXA L2a and L2b data products

Overview of JAXA L2a and L2b data products containing retrieved aerosol, cloud, precipitation and radiation parameters.

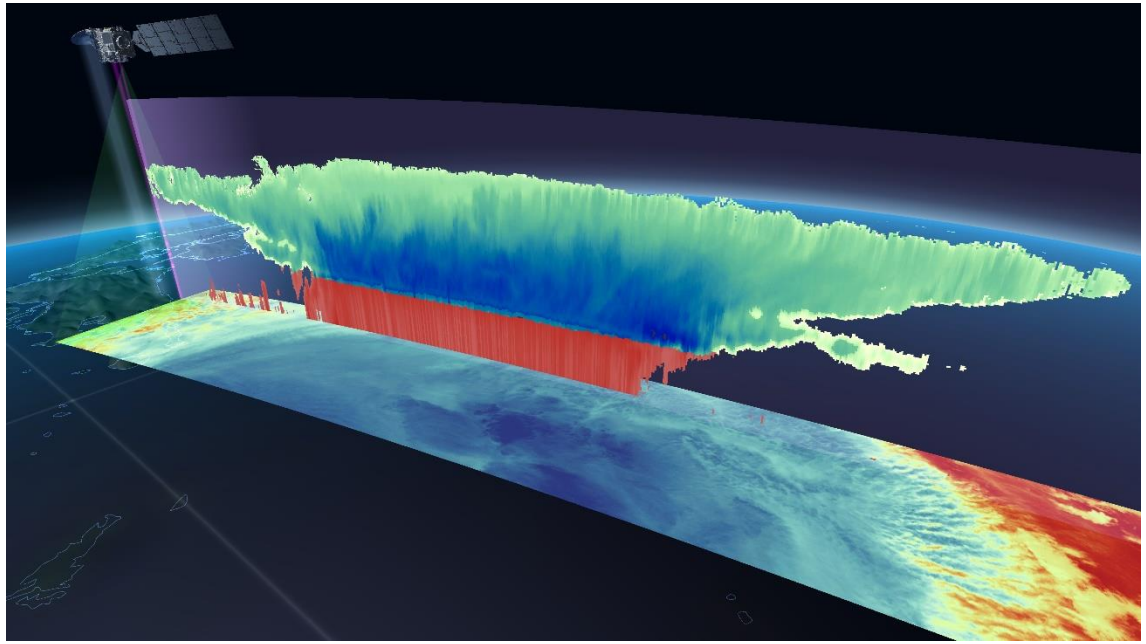
The column in the middle lists the names of the respective L2 data products (Wehr et al. 2023, *AMT*).

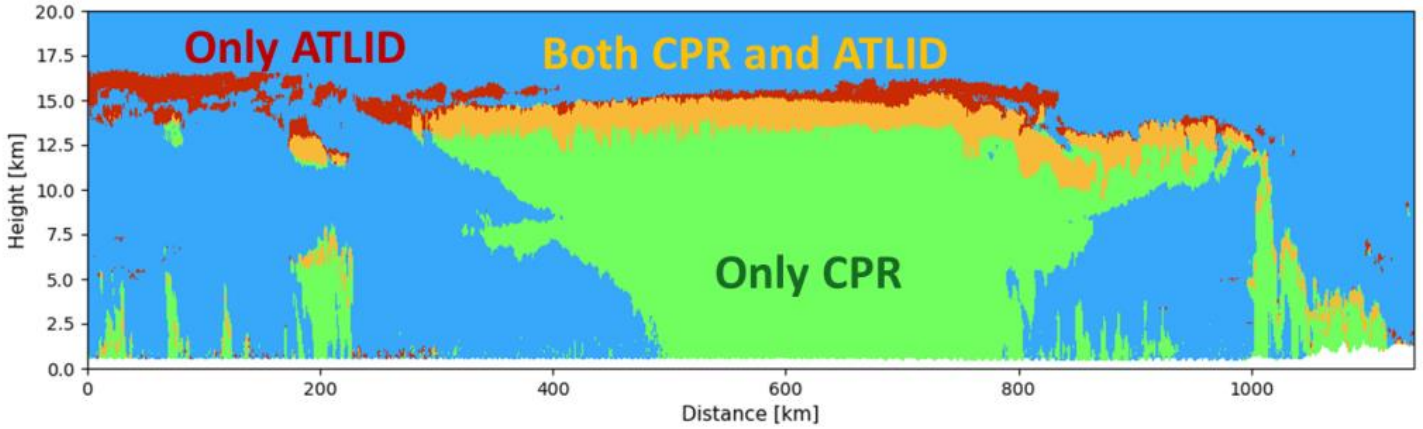
The product overview was described in Eisinger et al. (2024, *AMT*).

Overview of JAXA L2 products



An example of synergistic cloud images by sensors onboard EarthCARE





JAXA released first image of the synergistic cloud synergy on 4th Oct. 2024:
Observation results of Typhoon Shanshan (2024), approaching the Japanese archipelago.
Observation time: 17UTC on 27 August 2024.

https://www.satnavi.jaxa.jp/en/news/2024/10/04/9923/index.html

The CPR is sensitive to thick cloud, while the ATLID is sensitive to aerosol and thin cloud. Combining the CPR and the ATLID allows observation of a wider range of cloud types. In addition, in cloud areas where both the CPR and the ATLID can observe, the cloud amount can be estimated more accurately using both sensors.

Save the Date: EarthCARE In-Orbit Science and Validation Workshop planned for Dec 1st-5th, 2025

We are pleased to announce the event held in Japan:

2025 ESA-JAXA EarthCARE In-Orbit Science and Validation Workshop

scheduled for 1st -5th December at the University of Tokyo, Japan.

We look forward to welcoming you to Tokyo and continuing the EarthCARE collaboration!

Venue: Yayoi Auditorium Ichijo Hall in University of Tokyo, Japan.