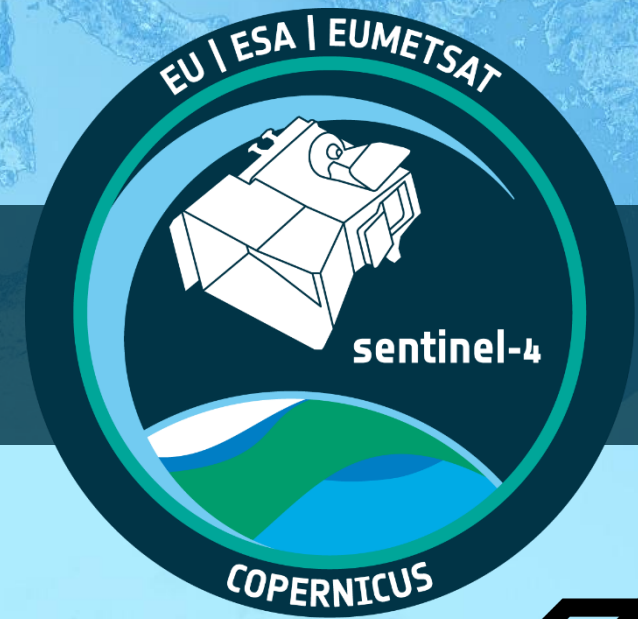


SENTINEL-4 LEVEL-2 FIRST IMPRESSIONS

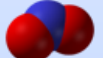
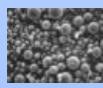
Diego Loyola on behalf L2OP & AC-SAF
CEOS AC-VC #22, Leiden, 2026-06-2



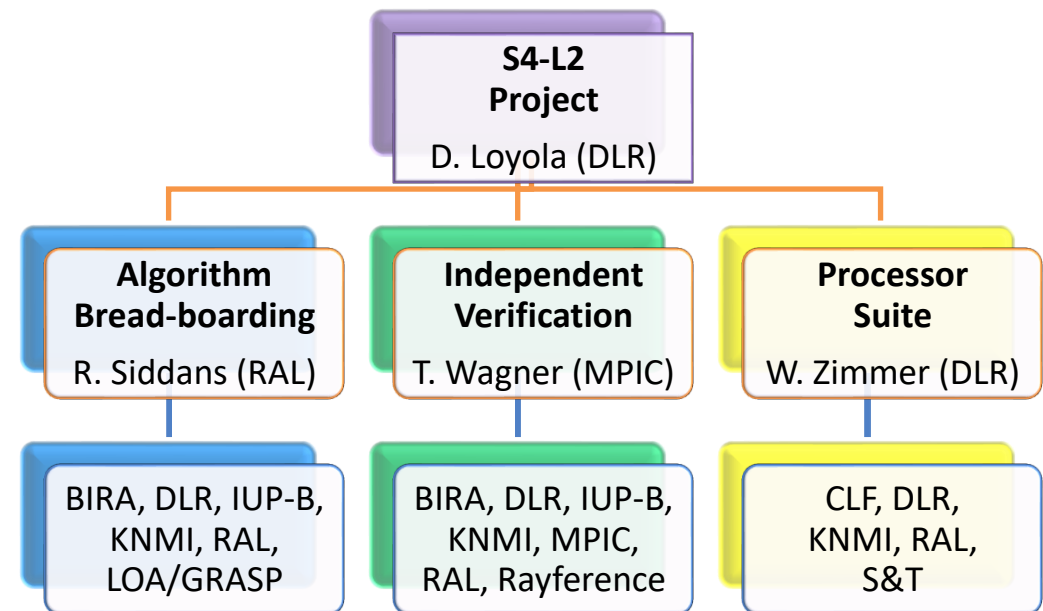
Overview

- L2OP and AC-SAF
- L2 Product Status
- Outlook

Sentinel-4 Copernicus Geophysical L2-Products

Sentinel-4 Products			
Species	Parameter	ABB	L2OP
O ₃ 	Total column	DLR	DLR
	Tropospheric column	RAL	RAL
NO ₂ 	Total column	IUP-B	DLR
	Tropospheric column	IUP-B	DLR
SO ₂ 	Total column	BIRA	DLR
HCHO 	Total column	BIRA	DLR
CHOCHO 	Total column	IUP-B	DLR
Cloud 	Cloud fraction	DLR	DLR
	Optical depth	DLR	DLR
	Cloud height	DLR	DLR
Aerosol 	Index	KNMI	DLR
	Optical depth	GRASP	CLF
	Layer Height	KNMI	DLR
Surface	BRDF & w.s. Albedo	GRASP	CLF

– Development phase: ESA with DLR as prime



– Operational phase: EUMETSAT with DLR as service manager

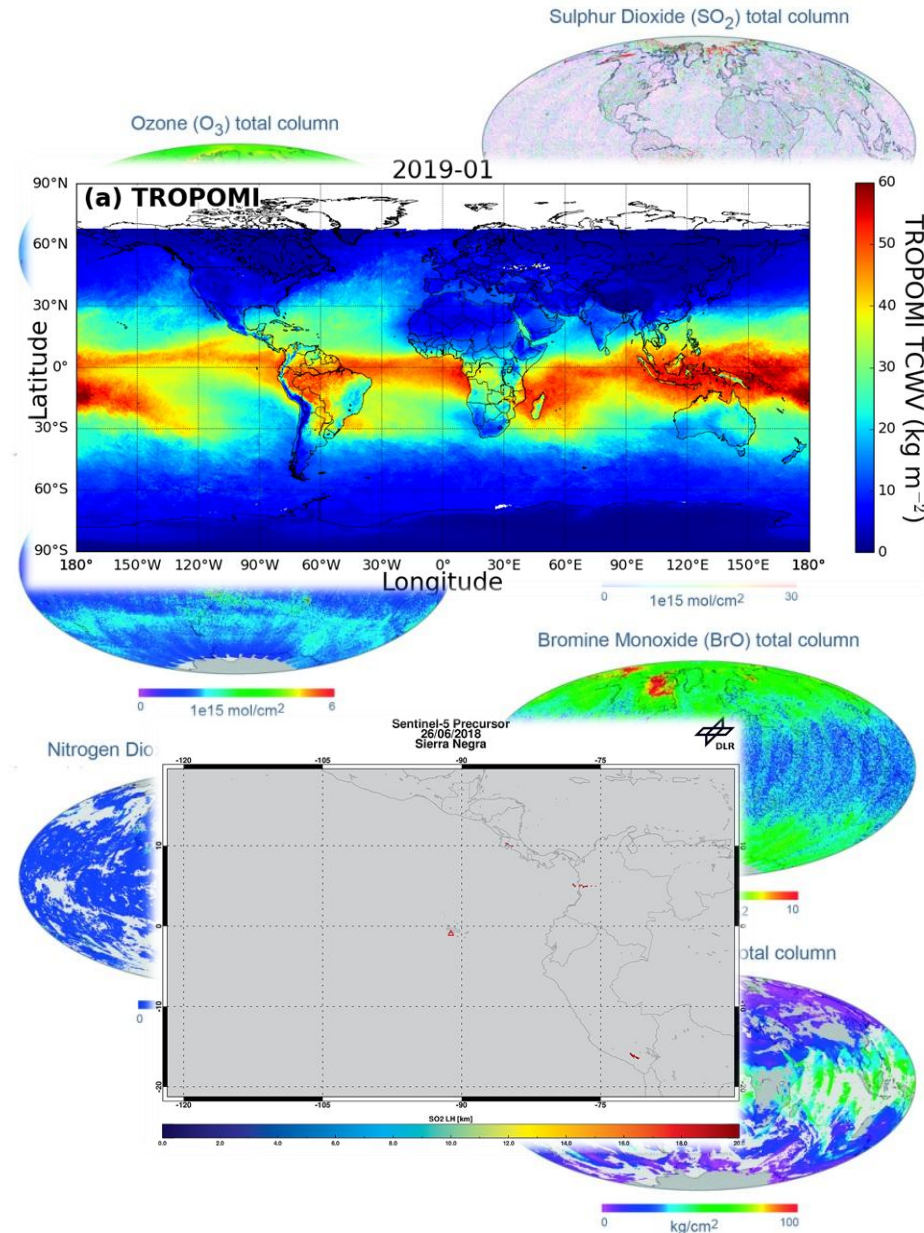
– Launch: MTG-S1 07/2025 and MTG-S2 in ~2032

Sentinel-4 L2OP Interdependencies (19 processors)

	RI-ECA	BG-NO2	BG-SO2	BG-HCH	BG-CHO	L2-CLD	L2-UAI	L2-SUR	L2-GSR	L2-OTO	L2-NO2	FCS-CMA	FCS-OCA	FCS-L1C
S4-L2-OTO	X					X			X					
S4-L2-OTR	X					X			X					
S4-L2-NO2	X	X				X	X		X					
S4-L2-SO2	X		X			X	X		X	X				
S4-L2-HCH	X			X		X	X		X					
S4-L2-CHO	X				X	X	X		X					
S4-L2-UAI	X					X			X					
S4-L2-ALH	X					X	X		X			X		
S4-L2-CLD	X								X			X	X	X
S4-L2-SUR	X					X		X		X	X			
S4-L2-GSR	X							X						

Sentinel-4 and EUMETSAT AC-SAF

- DLR provides a large number of operational GOME-2 products from MetOp-A, MetOp-B, and MetOp-C
- AC-SAF products developed and generated by DLR are used operationally by Copernicus CAMS
- DLR will provide AC-SAF Sentinel-4 and Sentinel-5 products
 - **Total Column Water Vapor (TCWV)**
 - **SO₂ Layer Height**
 - **Bromine Monoxide (BrO)**
 - **Chlorine Dioxide (OCIO)**
 - **Nitrous Acid (HONO)**
 - **Surface Properties (GE_LER)**
 - ...



GOME-2/MetOp
Chan *et al.* 2020
TROPOMI/S5p

Chan *et al.*, 2022

Vaquero *et al.*, 2022

Garane *et al.*, 2023

GOME-2/MetOp
Efremenko *et al.* 2017

TROPOMI/S5p

Hedelt *et al.* 2019

Koukouli *et al.* 2022

Inness *et al.* 2022

OMI/AURA
Fedkin *et al.* 2021

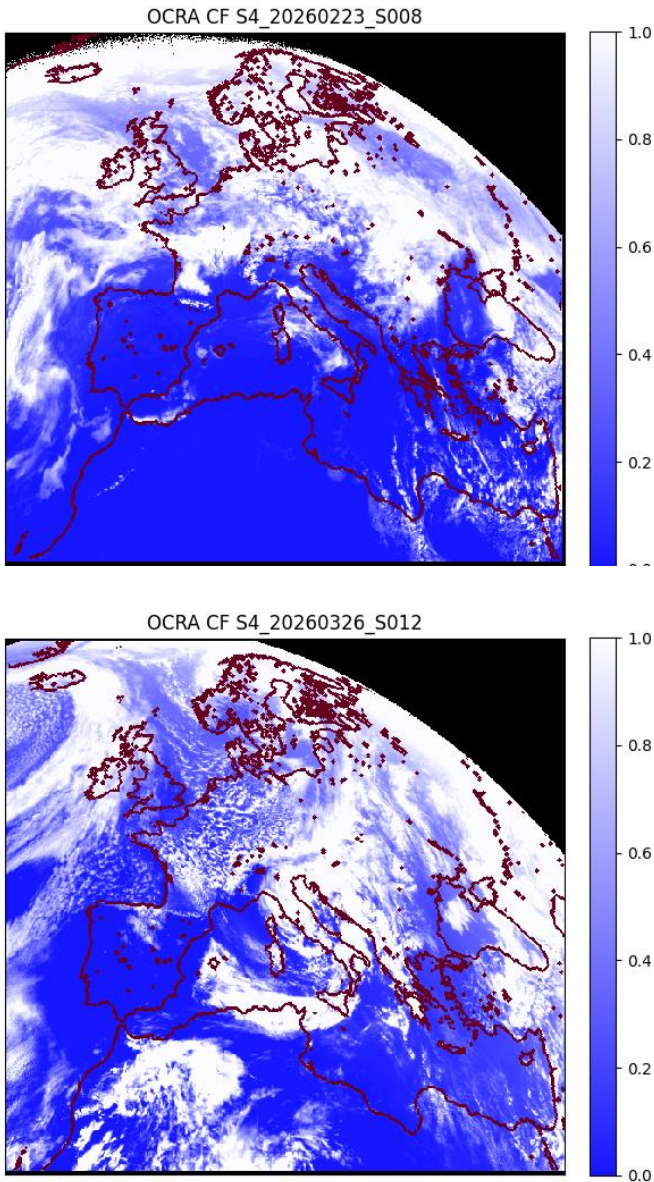
Overview

- L2OP and AC-SAF
- **L2 Product Status**
- Outlook

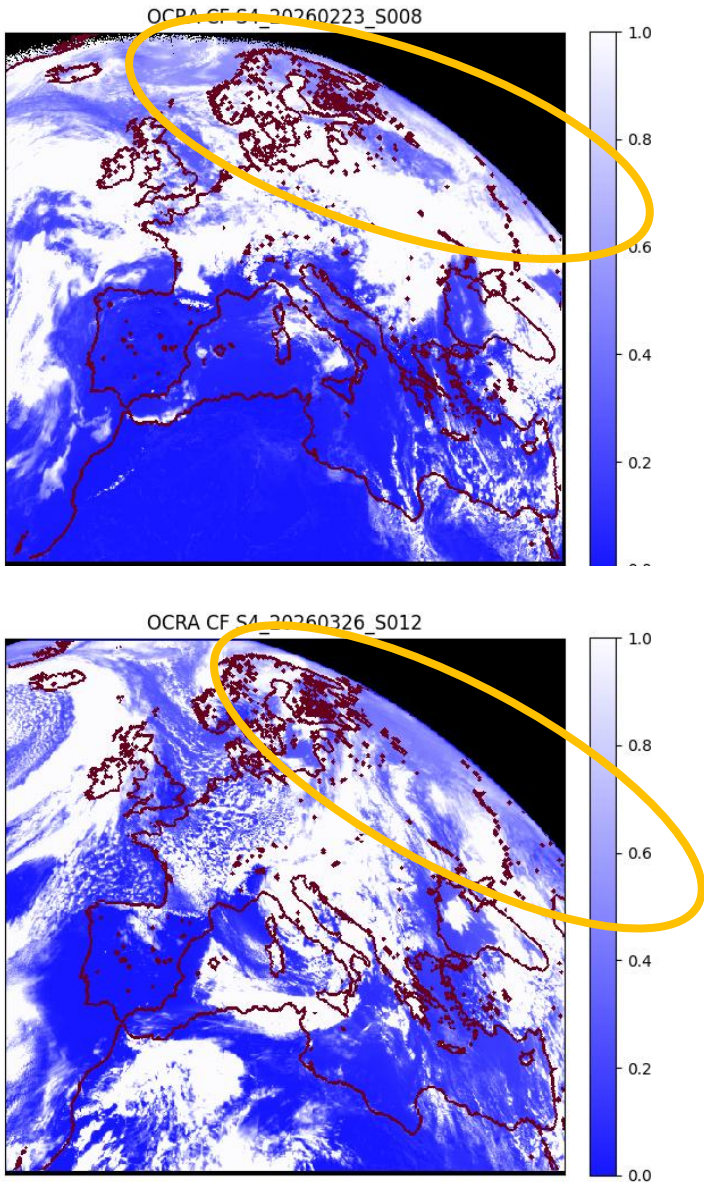
Cloud Fraction (OCRA in UV/VIS)

Victor Molina Garcia (DLR)

Current version 2.6



Upcoming version 2.7

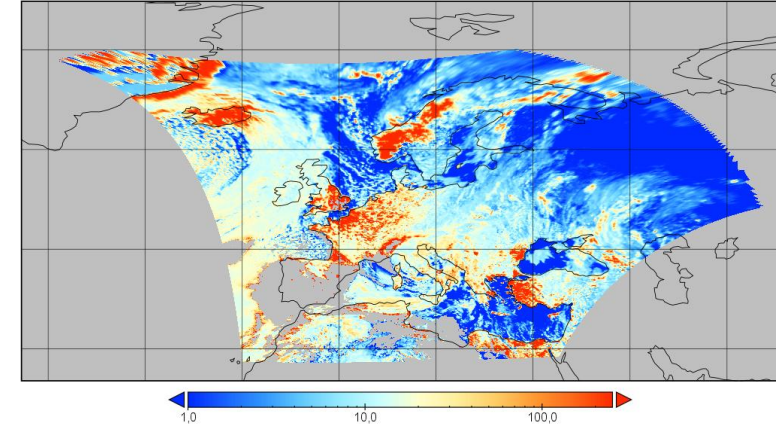
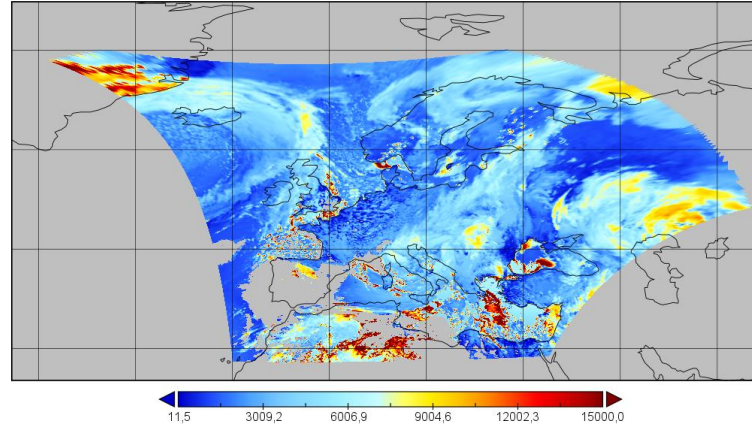


Cloud Properties (ROCINN in NIR)

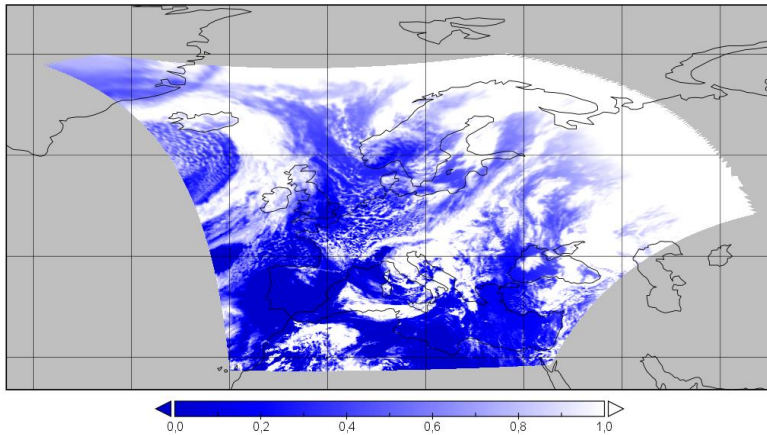
Ronny Lutz, Athina Argyrouli , (DLR)

- CRB: cloud height and cloud albedo
- CAL: cloud-top height and cloud optical thickness

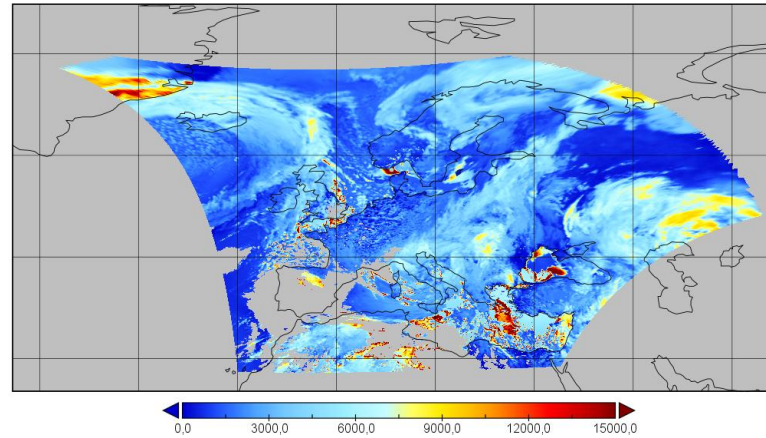
Cloud-Top Height and Cloud Optical Thickness from ROCINN CAL



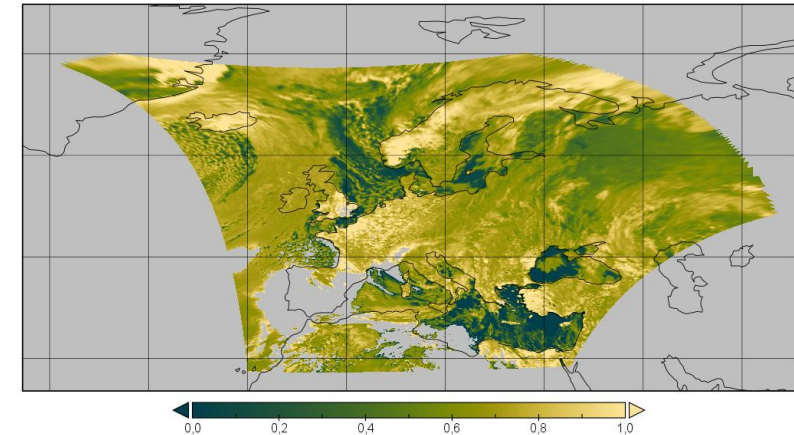
Cloud Fraction from OCRA



Cloud Height from ROCINN CRB



Cloud Albedo from ROCINN CRB



Total O₃

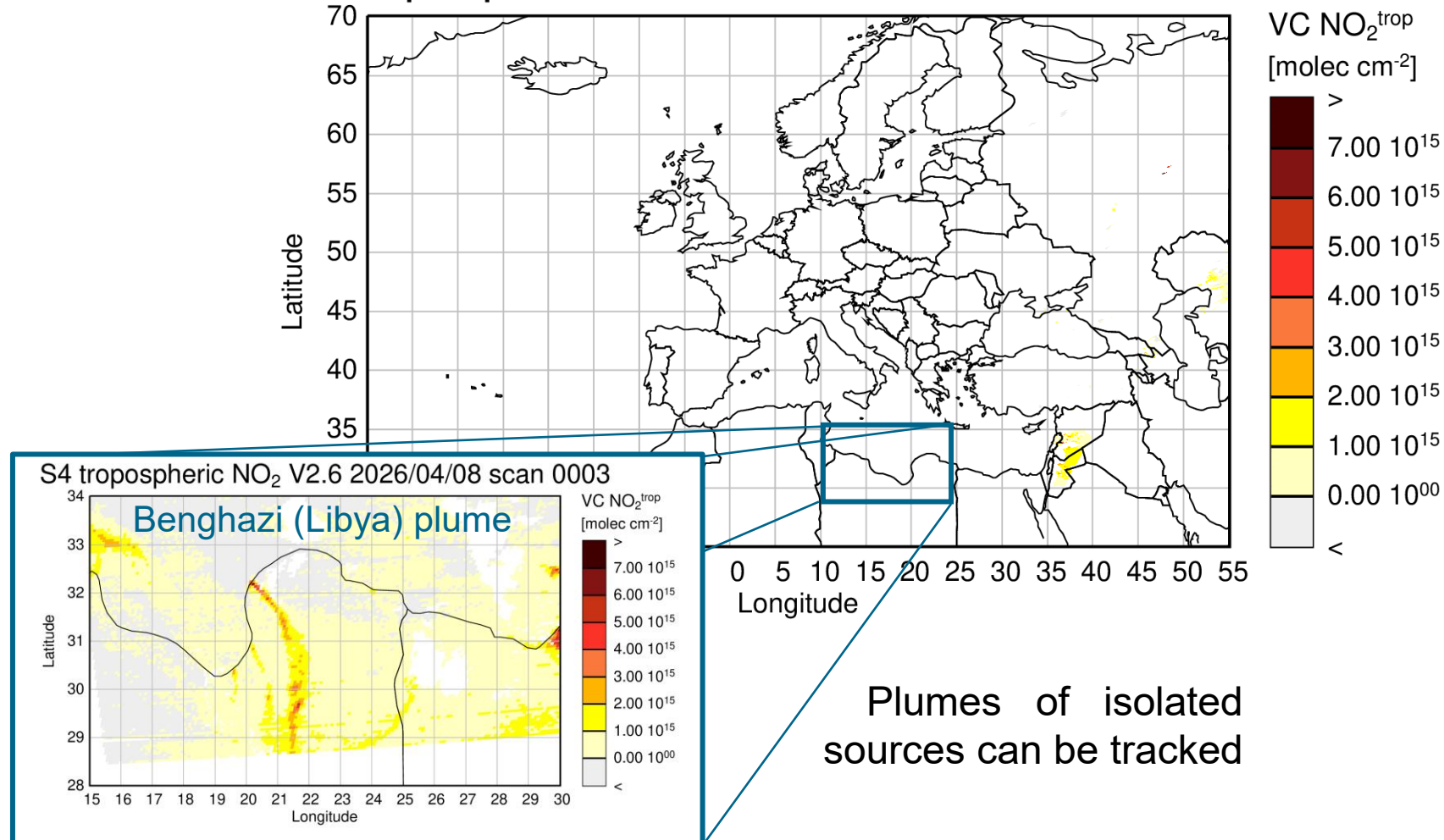
Klaus-Peter Heue (DLR)



Tropospheric NO₂

Andreas Richter (IUP-Bremen)

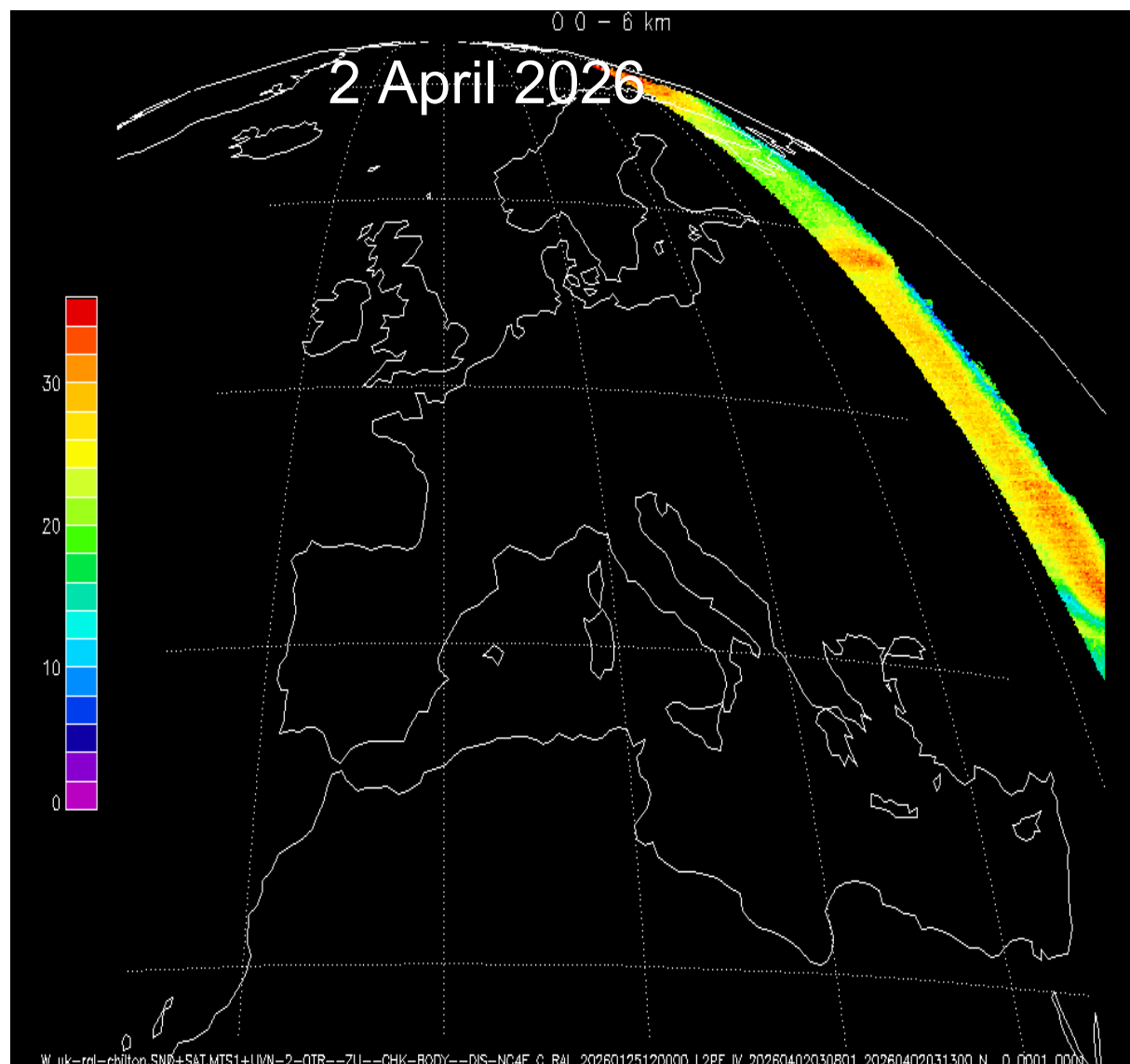
S4 tropospheric NO₂ V2.6 2026/04/08 scan 0002



Tropospheric O₃

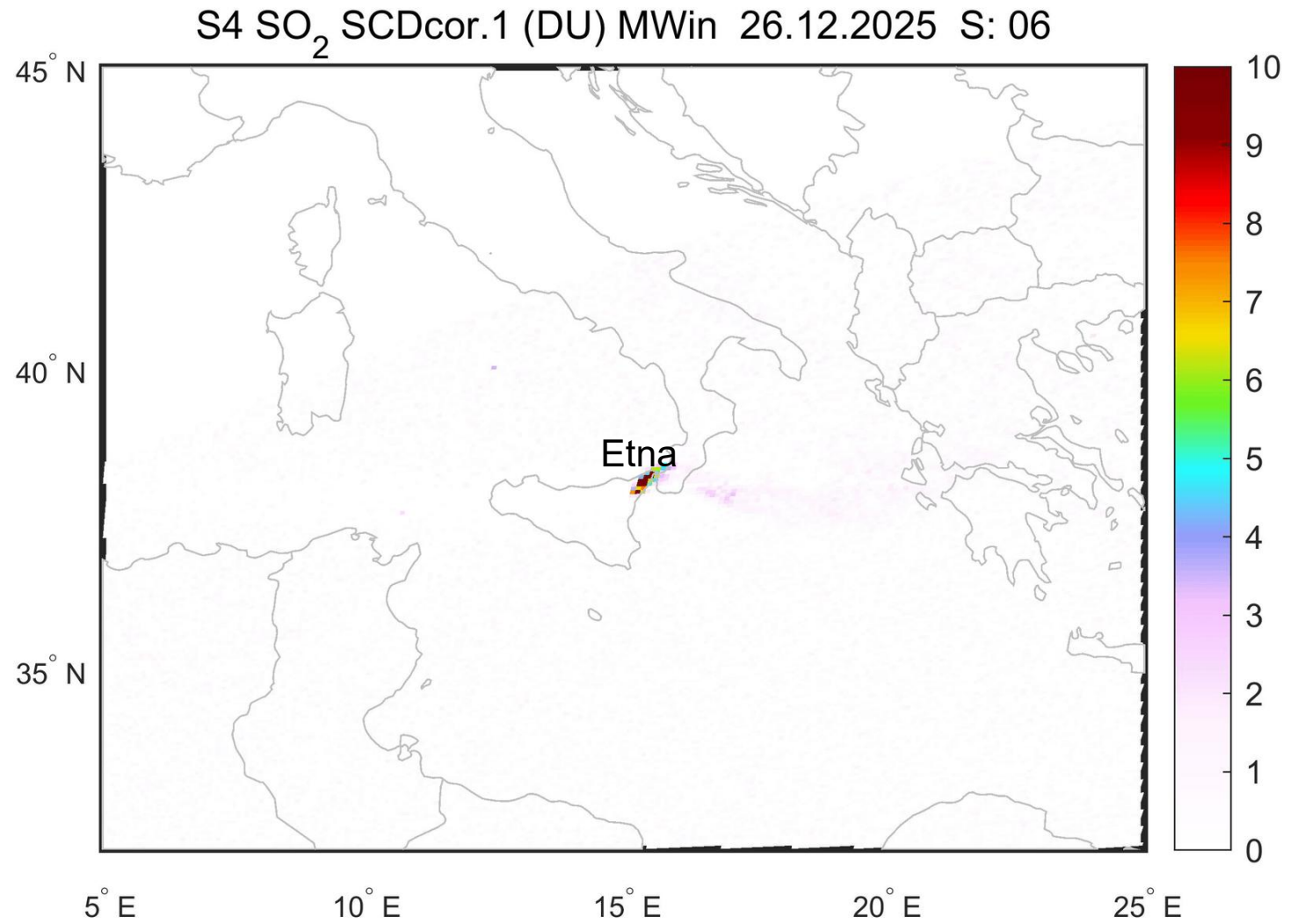
Richard Siddans (RAL)

S4 0-6km Ozone



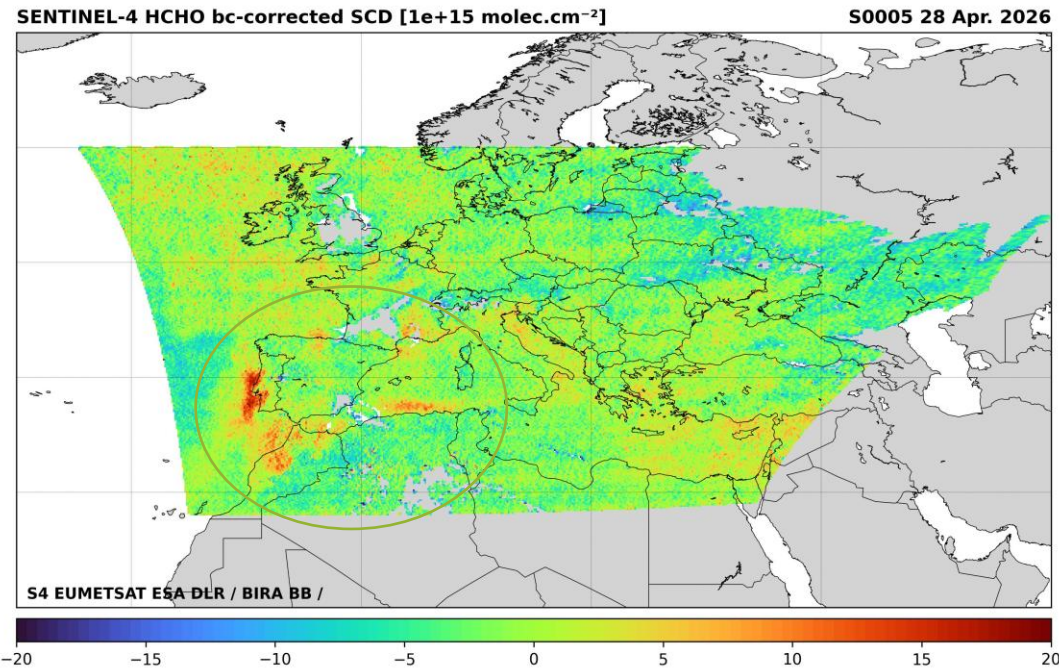
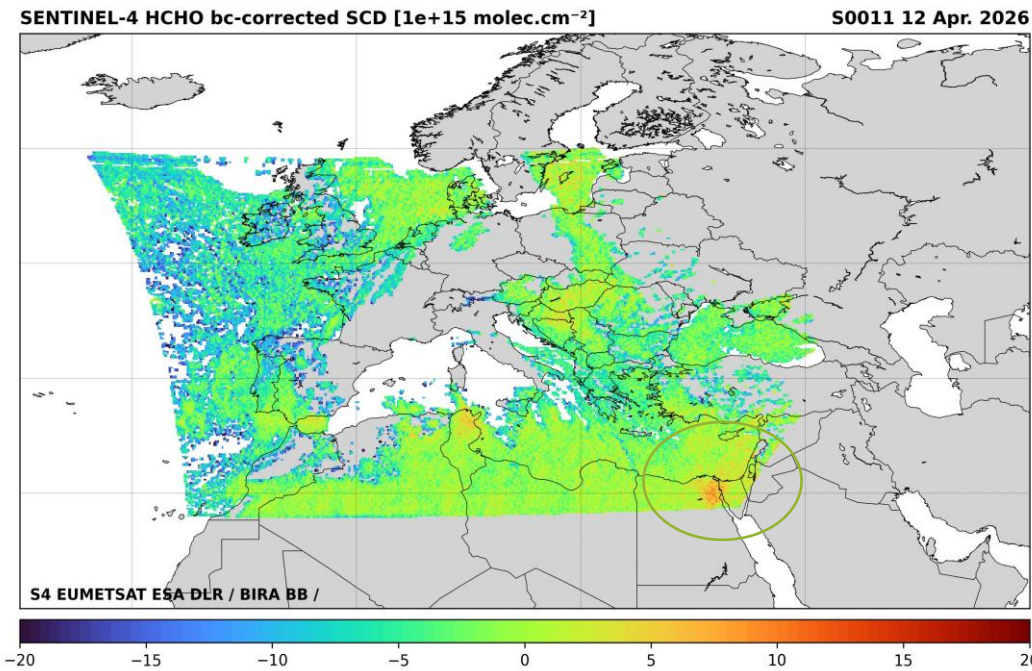
SO₂

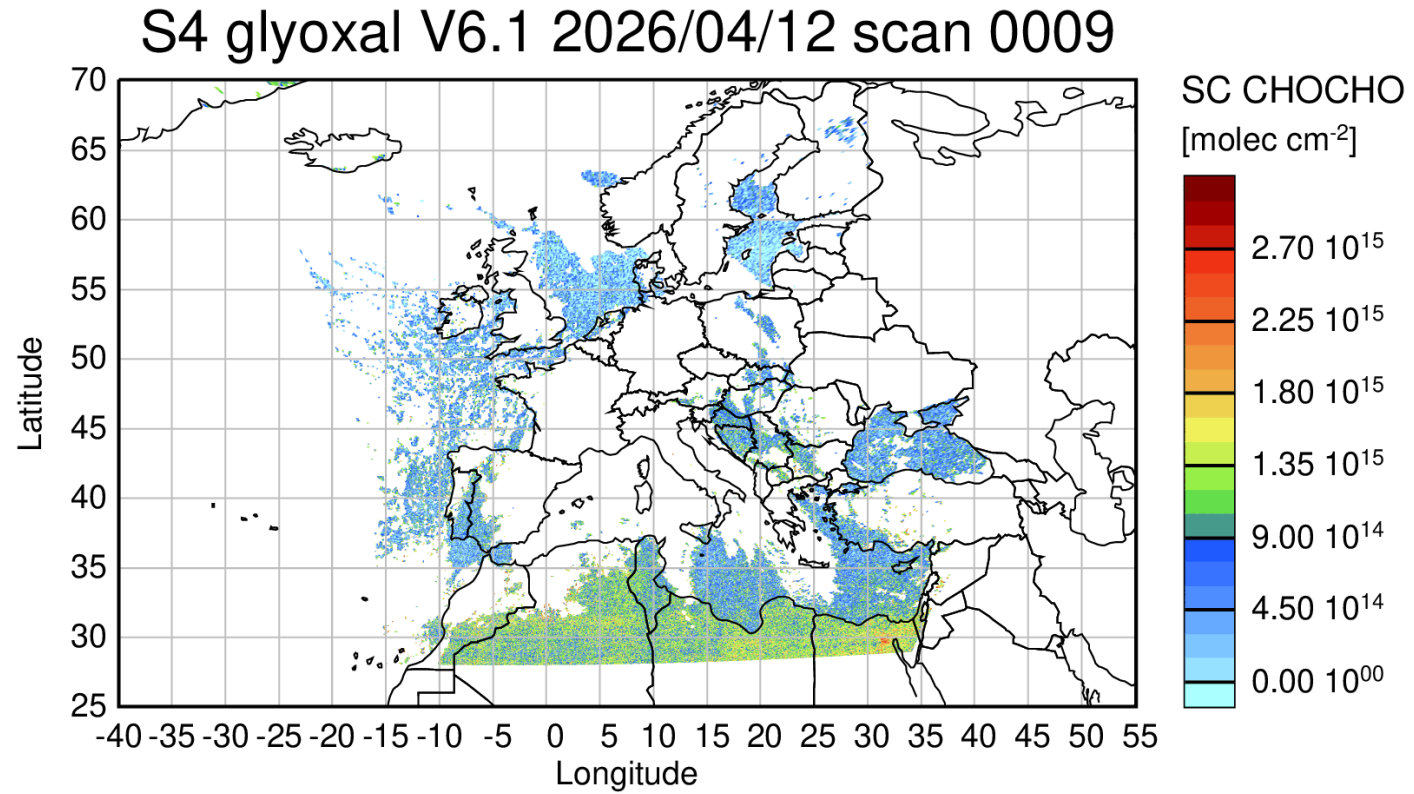
Nicolas Theys (BIRA)



HCHO

Jeroen van Gent (BIRA)





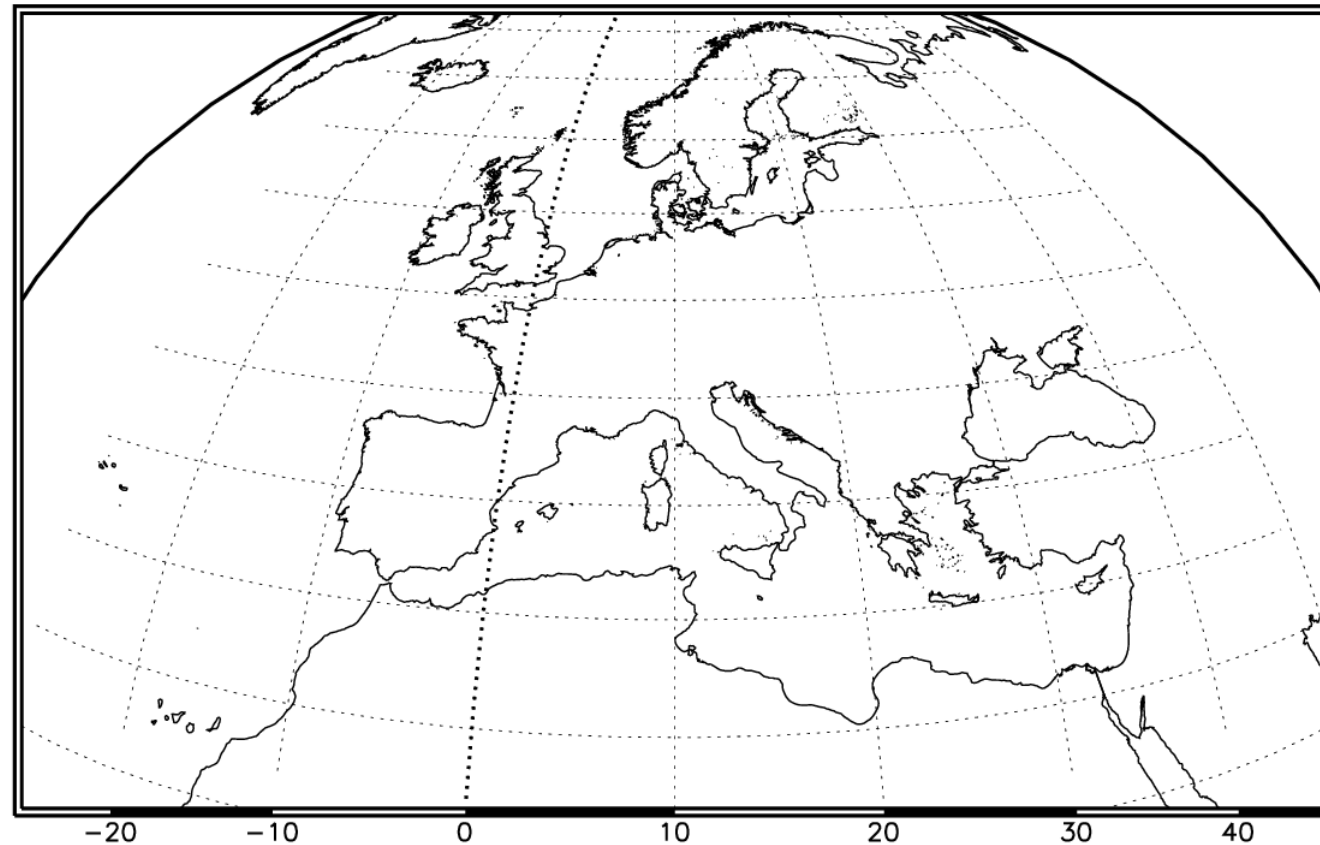
Absorbing Aerosol Index

M. de Graaf, P. Veefkind (KNMI)

2026-03-07
03:23:02-04:22:29

L2-UAI-2.6.0 UPAS
MTG True Colour

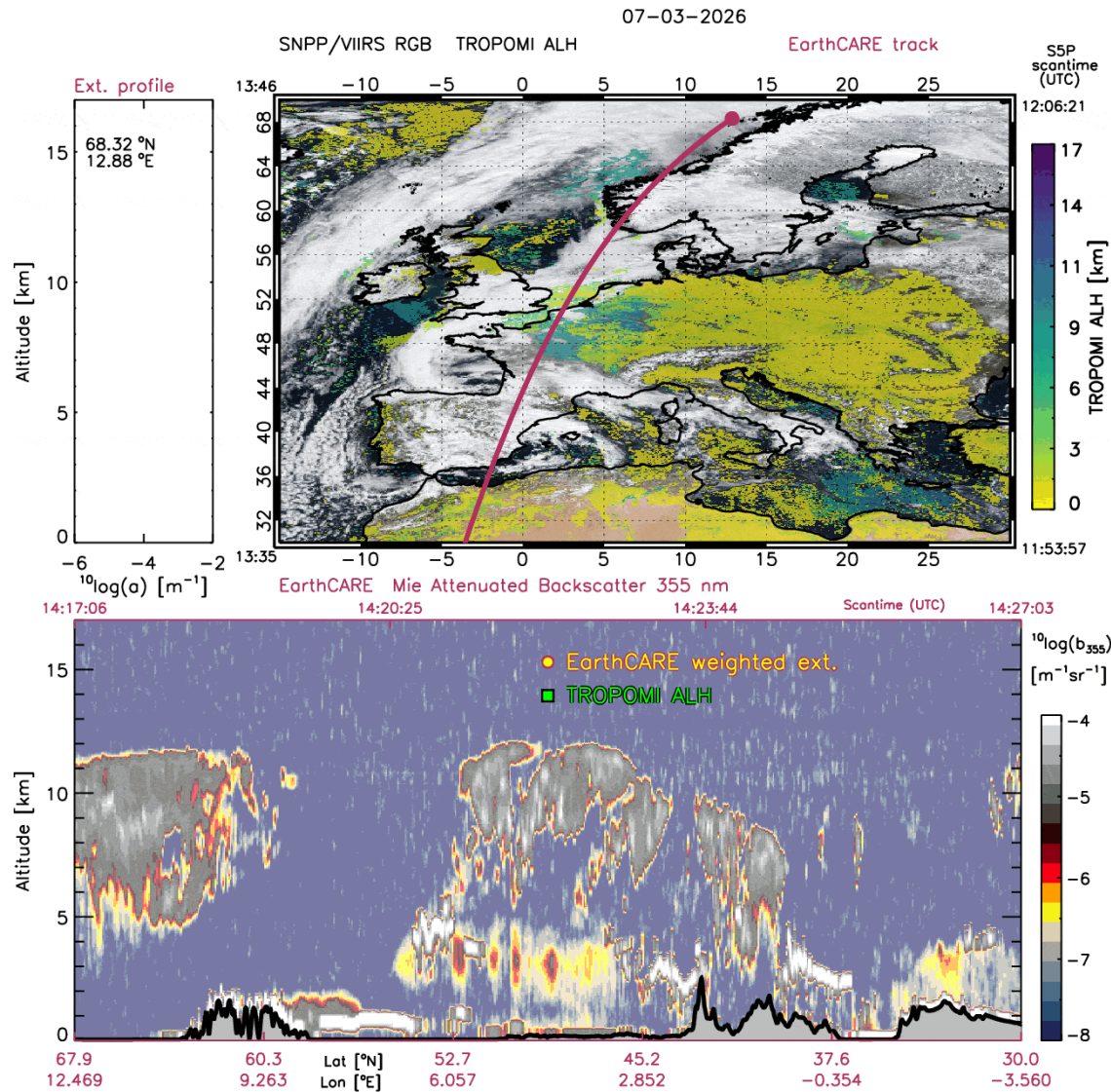
proc._0007
rep.cycle 1



Combined S4-UAI and FCI RGB on 7 March 2026

Aerosol Layer Height

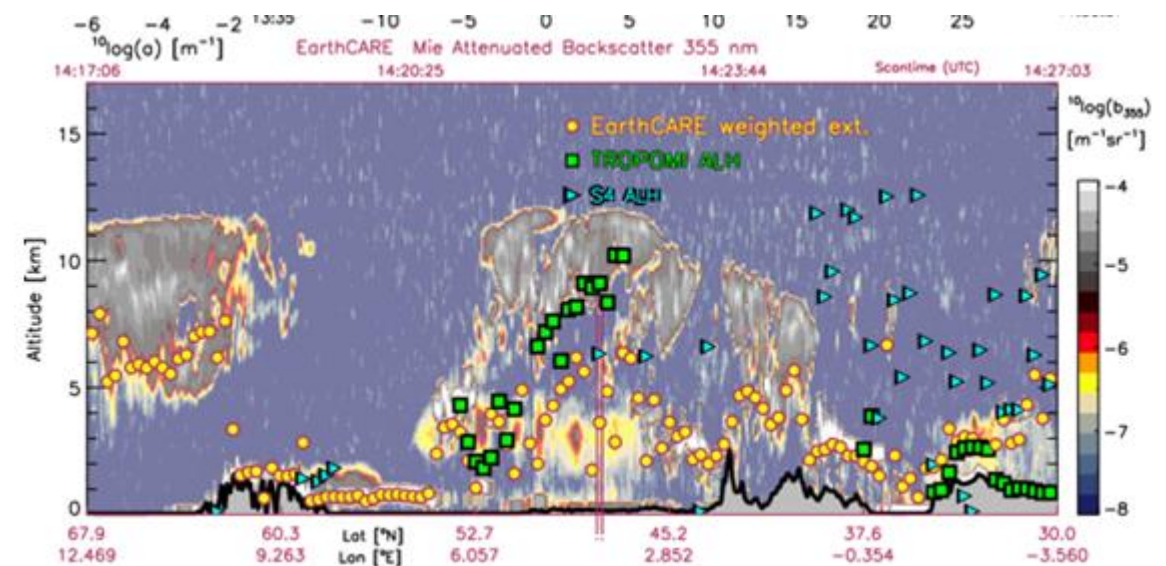
M. de Graaf, P. Veefkind (KNMI)

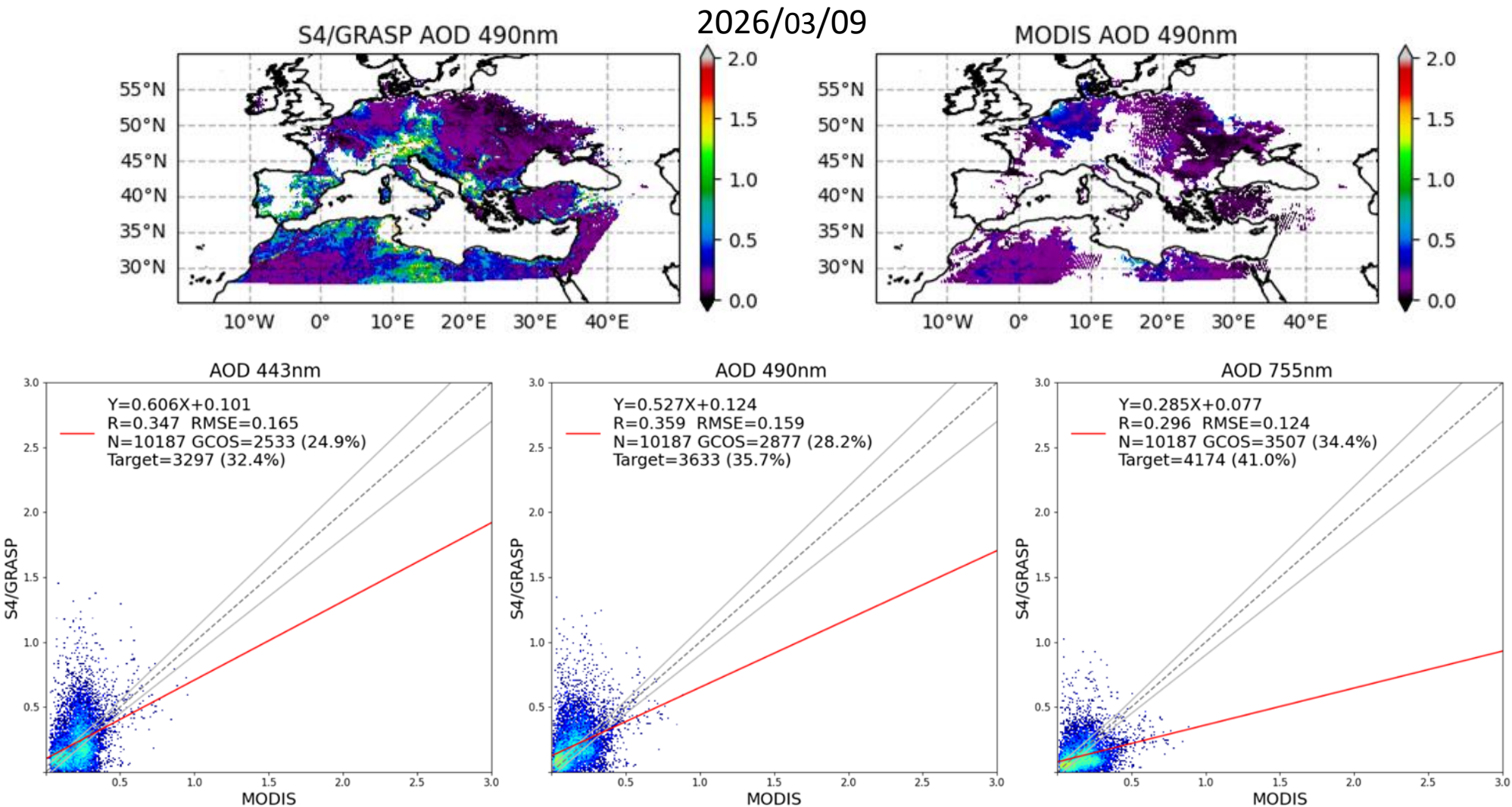


- Saharan dust plume overpassed by EarthCARE on 7 March 2026.

- ATLID weighted extinction
- TROPOMI ALH

- S4 ALH

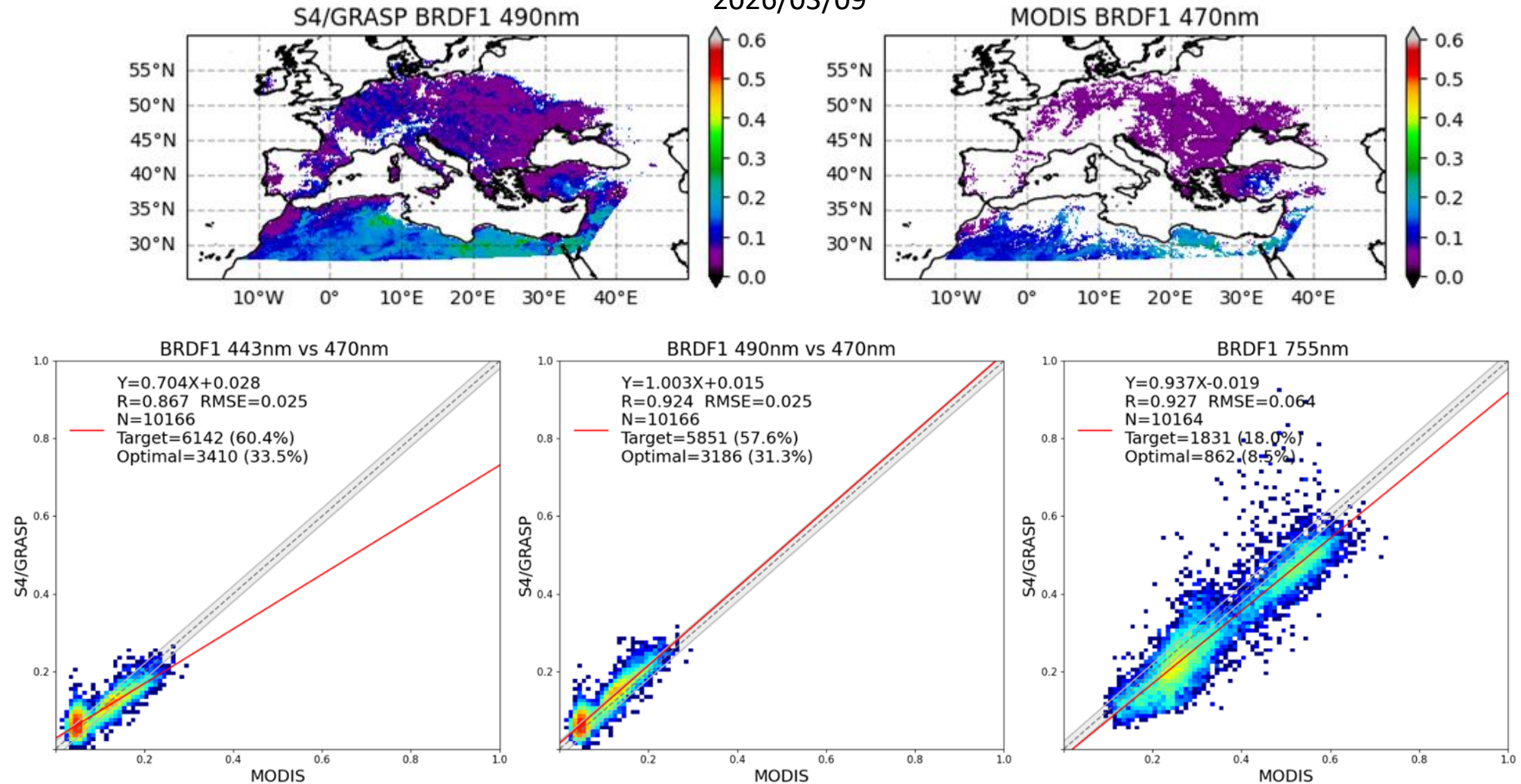


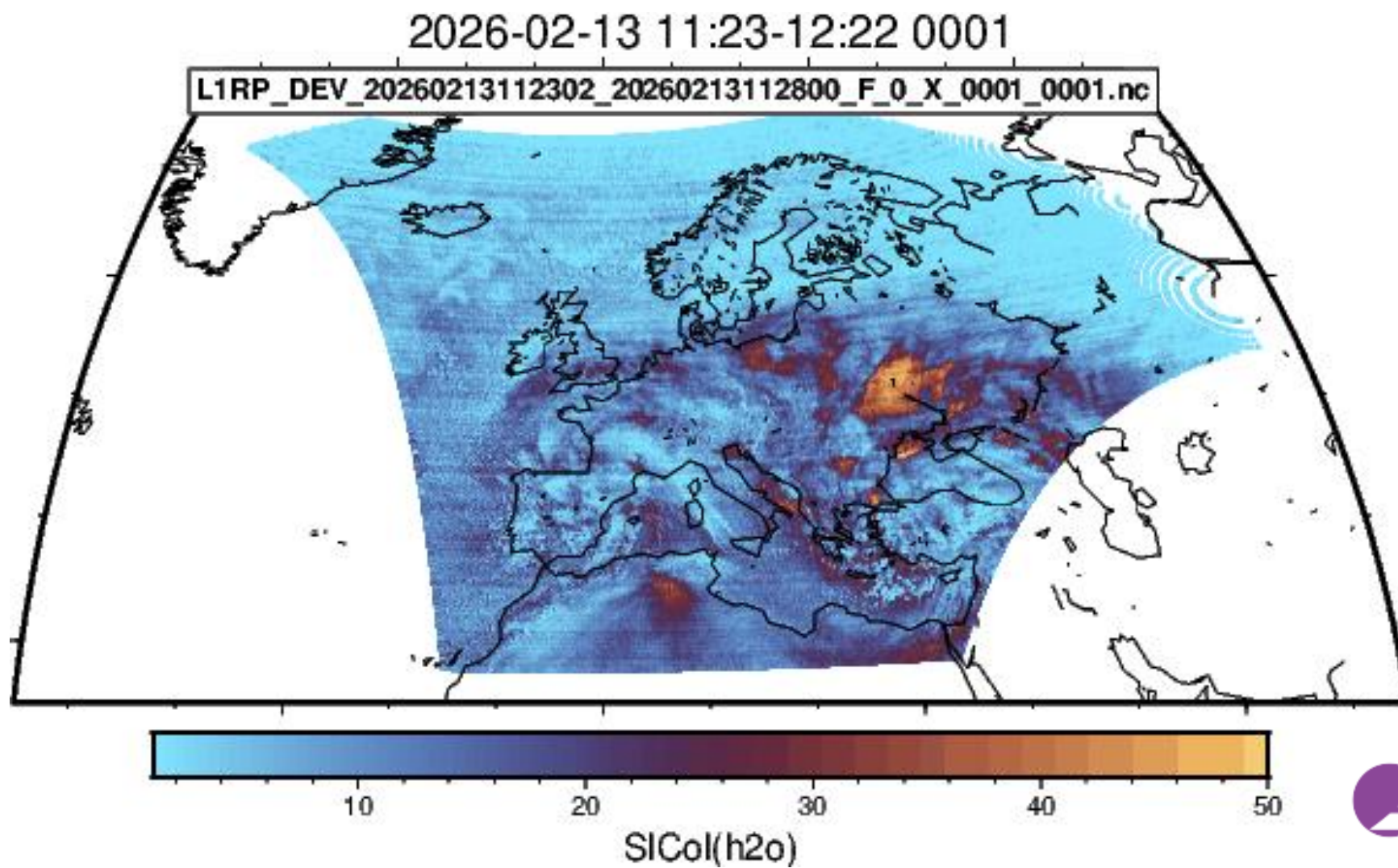


SUR/GSR BRDF

Pavel Litvinov (GRASP)

2026/03/09





Overview

- L2OP and AC-SAF
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Sentinel-4 L2OP Next Steps

- L2OP V2.7 to be delivered end of June 2026
- Cal/Val could start in August/September for the products reaching agreed hand-over criteria
- L2OP V3 with destriping foreseen for Sep./Oct. 2026
 - Changes to existing processors, add new processors, changes to the ground-segment