Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP

Progress Meeting 02
[PM02]

Virtual
16/05/2023
12:00-13:30 CET

- *Agenda.*

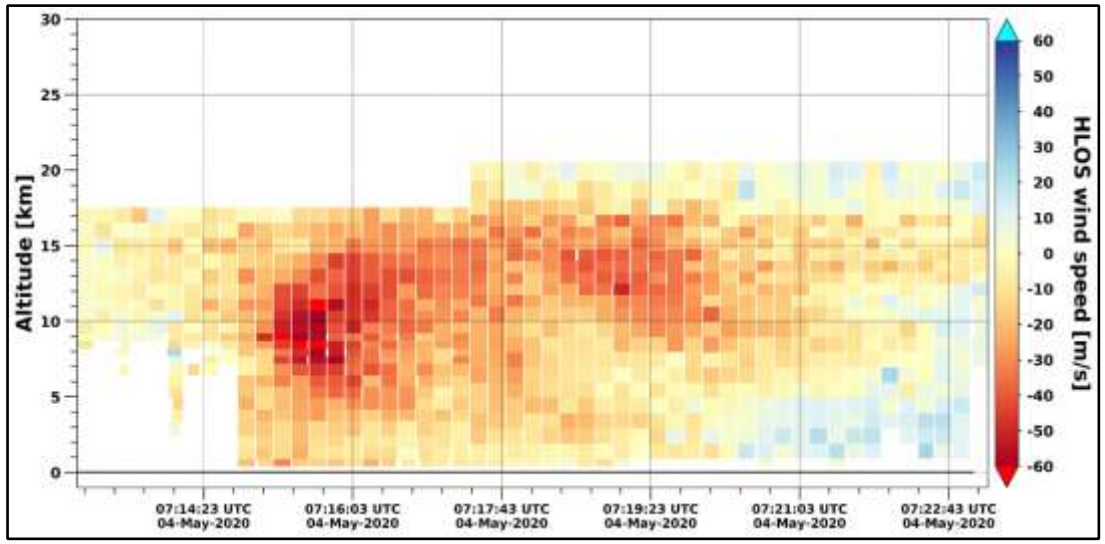
Title:	Introduction – Welcome.	12:00 – 12:10
Presenter:	Christian Retscher (ESA), Vassilis Amiridis (NOA).	
Title:	WP1000 – Management, reporting and promotion.	12:10 – 12:25
Presenter:	Emmanouil Proestakis (NOA).	
Title:	WP2000 – ASKOS ground-based datasets in support of L2A+.	12:25 – 12:45
Presenter:	Holger Baars (TROPOS).	
Title:	WP3000 – Development of the L2A+ aerosol product.	12:45 – 13:05
Presenter:	Konstantinos Rizos (NOA).	
Title:	WP4000 – Assimilation of L2A/L2A+ and application of WRF-L experiments - KO.	13:05 – 13:10
Presenter:	Athanasios Georgiou (NOA).	
Title:	Summary, discussion and Concluding Remarks.	13:10-end of PM02

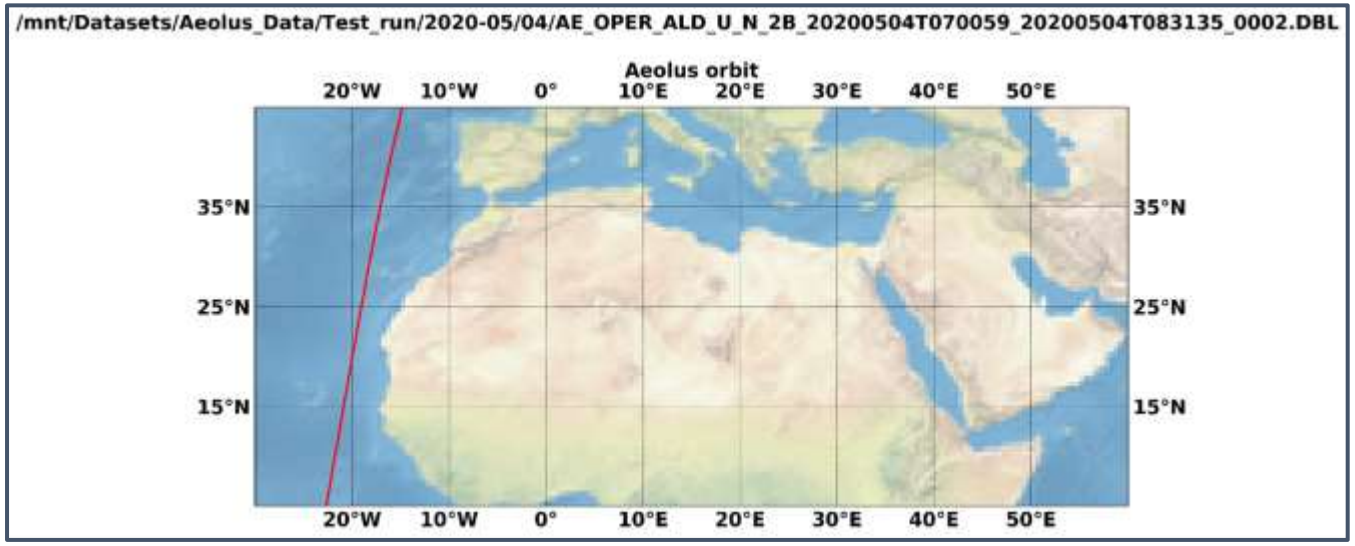
L2A+

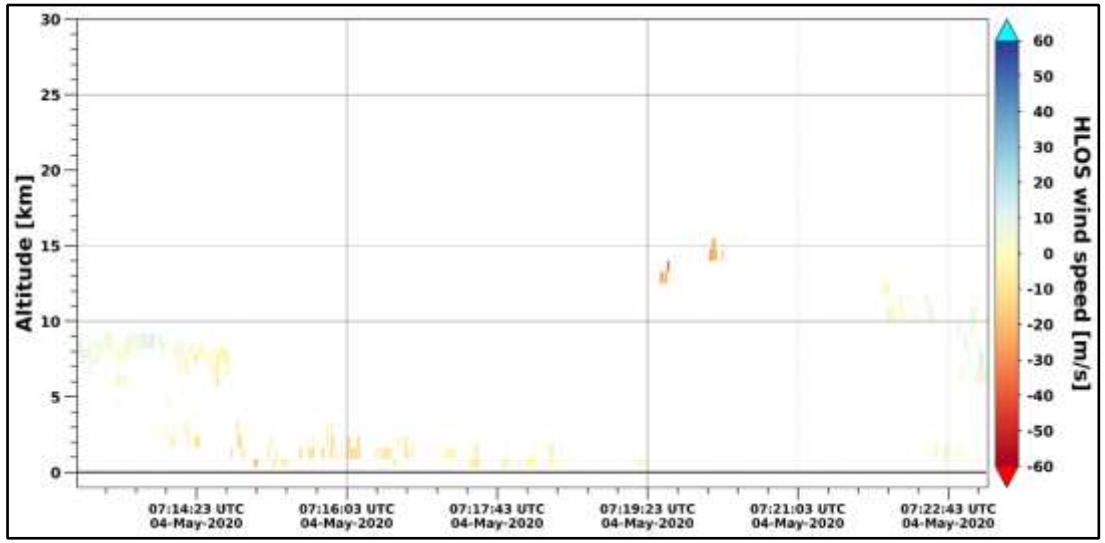
Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

- Background.

Aeolus, ESA's DWL – ALADIN – space mission provided:
- profiles of the HLOS wind component in the troposphere and the lower stratosphere.
- profiles of optical properties of aerosols and clouds (i.e., extinction/backscatter coefficients, lidar ratio).



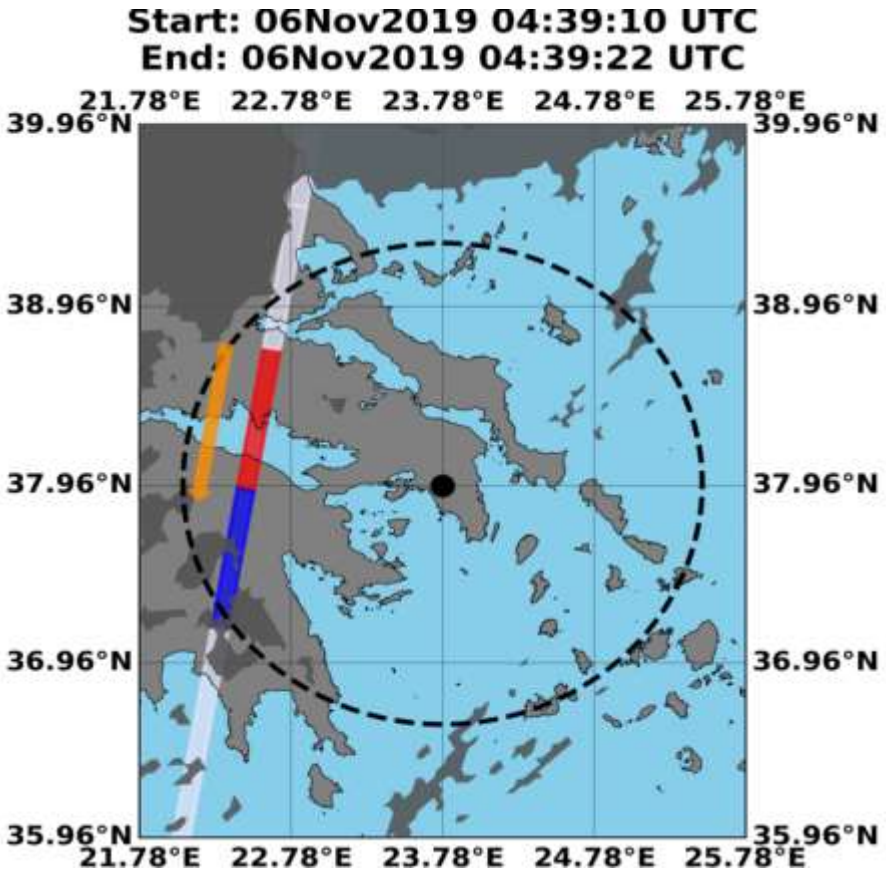




L2A+

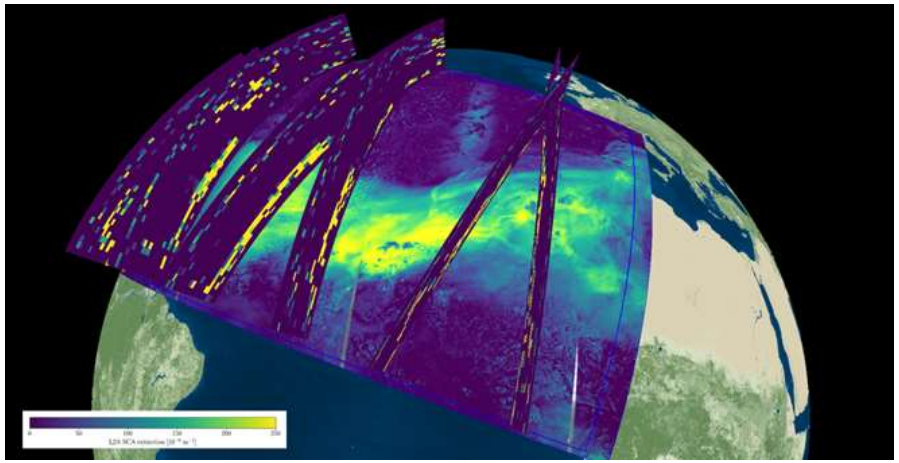
Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

- Challenge (1): Cloud Contamination.

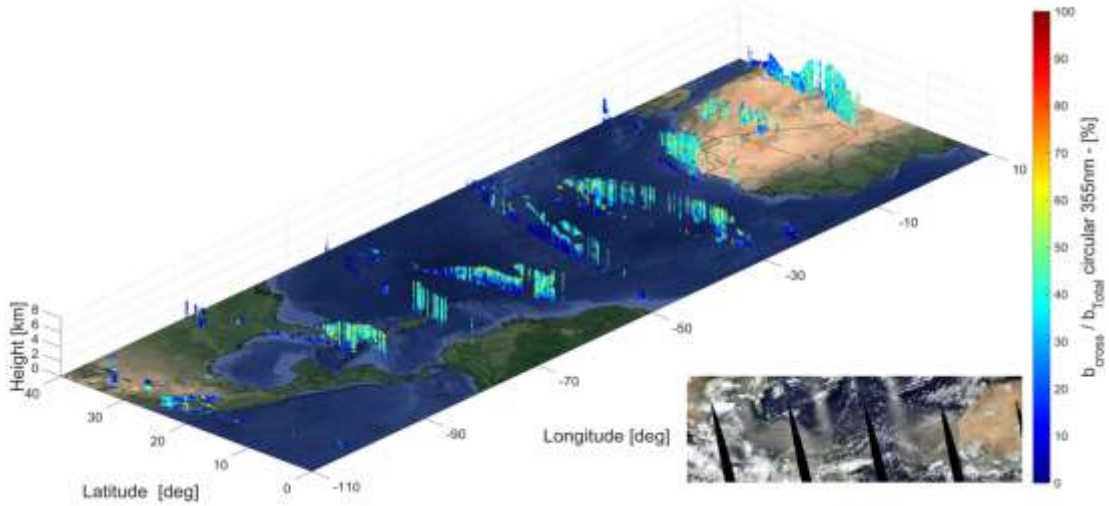


(Gkikas et al., 2023, ACP)

- Challenge (2): Undetected cross polar backscattered component.

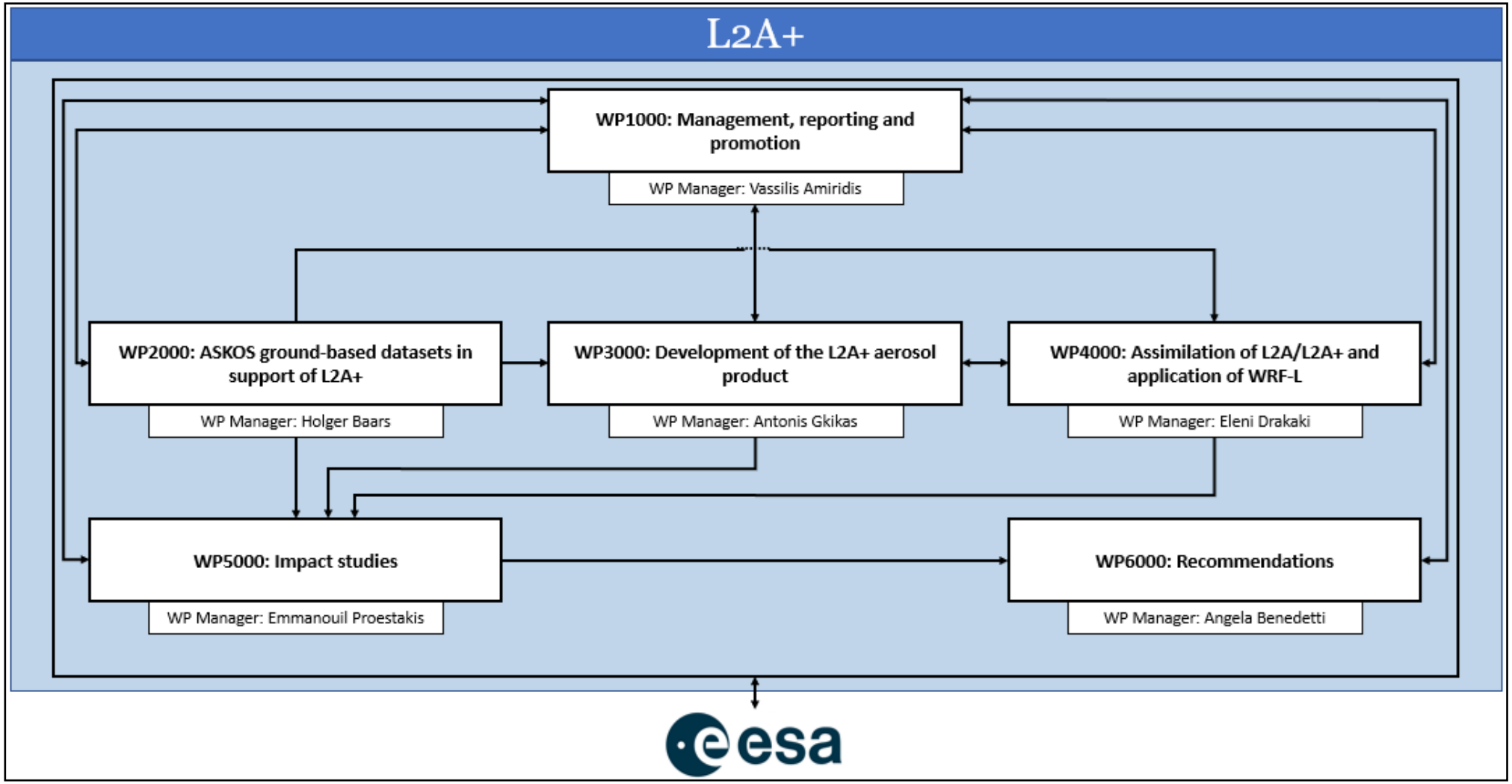


Retrieved from: esa.int



Estimates of Aeolus L2A underestimation due to the missing cross-channel using the Aeolus-like profiles retrieved based on CALIPSO for the transAtlantic Godzilla dust event on the 23rd of June, 2020.

- *Work Breakdown Structure.*



L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

aeolus ECMWF TROPOS

- *The L2A+ Team.*

WP1000

V. Amiridis

WP2000

H. Baars

A. Floutsi

WP3000

A. Gkikas

K. Rizos

WP6000

A. Benedetti

WP4000

A. Georgiou

A. Kampouri

E. Drakaki

A. Tsikerdekis

WP5000

E. Proestakis

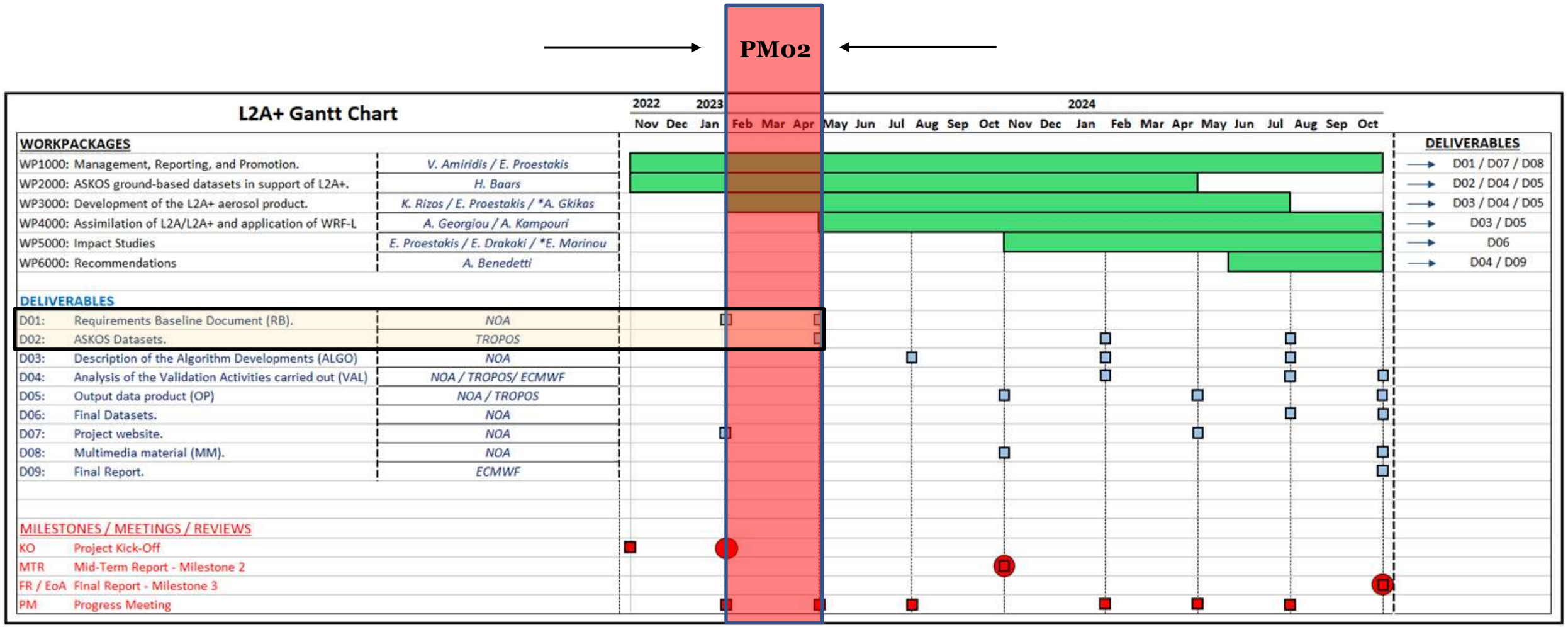
A. Kampouri

E. Drakaki

L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

- *L2A+ Gantt Chart.*



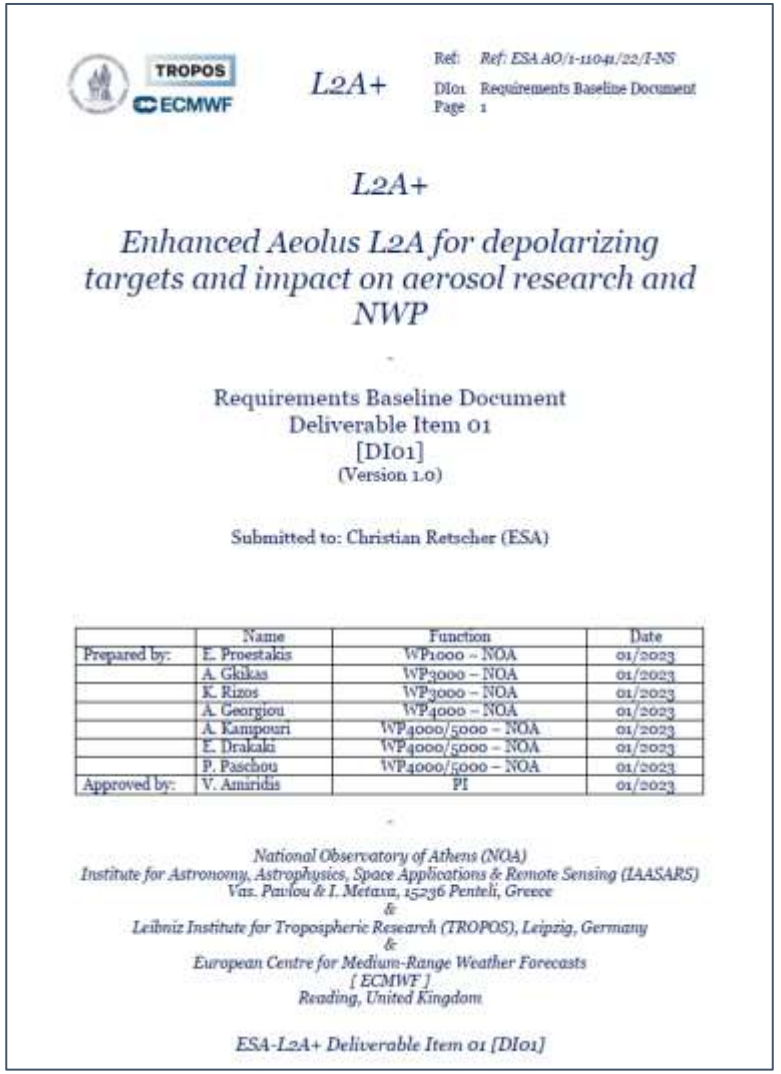
L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

WP1000: *Management, reporting and promotion.*

DI01 provides:

1) a **review** of (a) Aeolus L2A **products** (Flament et al., 2021; Ehlers et al., 2022), (b) AEL-FM and AEL-PRO, (c) CAMS, and (d) the assimilation technique to be applied over L2A+ RoI.
2) a **survey** of (a) satellite-based and (b) ground-based accessible **datasets** to be used for the framework of the developments and validation of L2A+ (WP3000/4000) and the evaluation of the model simulations, including the comparisons for the impact assessment of aerosol assimilation in NWP (WP5000). More specifically, includes the consolidation of the ESA-ASKOS/JATAC dataset for L2A+ needs (i.e. ground-based lidar measurements, water-vapour and wind profiles, radiosondes, airborne dropsondes and radiation measurements) to be used for evaluation of the NWP runs and impact studies (WP4000/5000).
3) an **overview** of concluded and ongoing **initiatives** and **projects** related to the technical and scientific overarching objectives of L2A+ (i.e., ESA-ASKOS / eVe / NEWTON / DOMOS).
4) a consolidated **risk analysis** pointing out which risk areas could affect the final success of the project and proposed solutions.



TROPOS ECMWF L2A+ Ref: Ref: ESA AO/1-11041/22/I-NS DI01 Requirements Baseline Document Page 1

L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP

Requirements Baseline Document
Deliverable Item 01
[DI01]
(Version 1.0)

Submitted to: Christian Retscher (ESA)

	Name	Function	Date
Prepared by:	E. Proestakis	WP1000 – NOA	01/2023
	A. Gkikas	WP3000 – NOA	01/2023
	K. Rizos	WP3000 – NOA	01/2023
	A. Georgiou	WP4000 – NOA	01/2023
	A. Kampouri	WP4000/5000 – NOA	01/2023
	E. Drakaki	WP4000/5000 – NOA	01/2023
	P. Paschou	WP4000/5000 – NOA	01/2023
Approved by:	V. Amiridis	PI	01/2023

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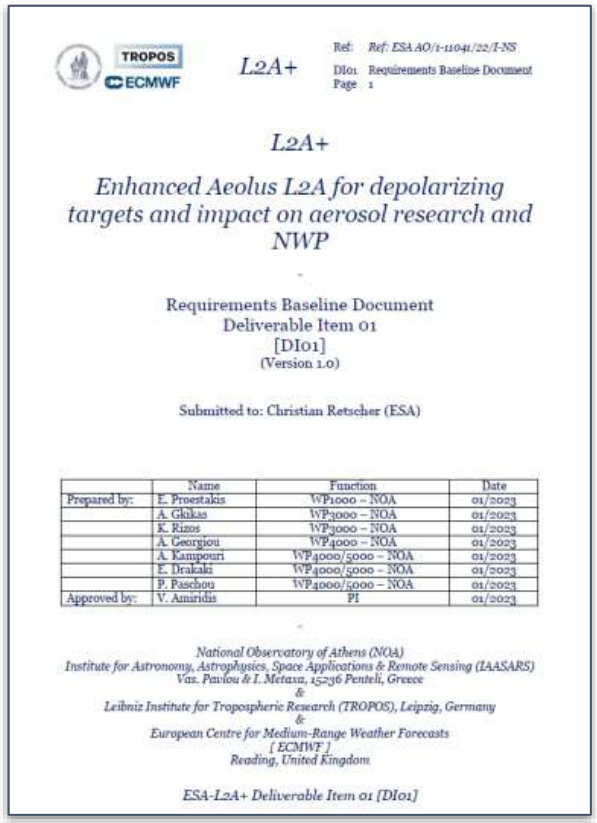
WP1000: *Management, reporting and promotion.*

Requirements Baseline Document - RBD - DI01

- Initial version - submission: T0+3 months.
- Final version - submission: T0+6 months.



TROPOS ECMWF L2A+ Ref: Ref: ESA AO/1-11041/22/I-NS DI01 Requirements Baseline Document Page 1

L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP

Requirements Baseline Document
Deliverable Item 01
[DI01]
(Version 1.0)

Submitted to: Christian Retscher (ESA)

	Name	Function	Date
Prepared by:	E. Proestakis	WP1000 – NOA	01/2023
	A. Gkikas	WP3000 – NOA	01/2023
	K. Rizos	WP3000 – NOA	01/2023
	A. Georgiou	WP4000 – NOA	01/2023
	A. Kampouri	WP4000/5000 – NOA	01/2023
	E. Drakaki	WP4000/5000 – NOA	01/2023
	P. Paschou	WP4000/5000 – NOA	01/2023
Approved by:	V. Amiridis	PI	01/2023

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Reading, United Kingdom

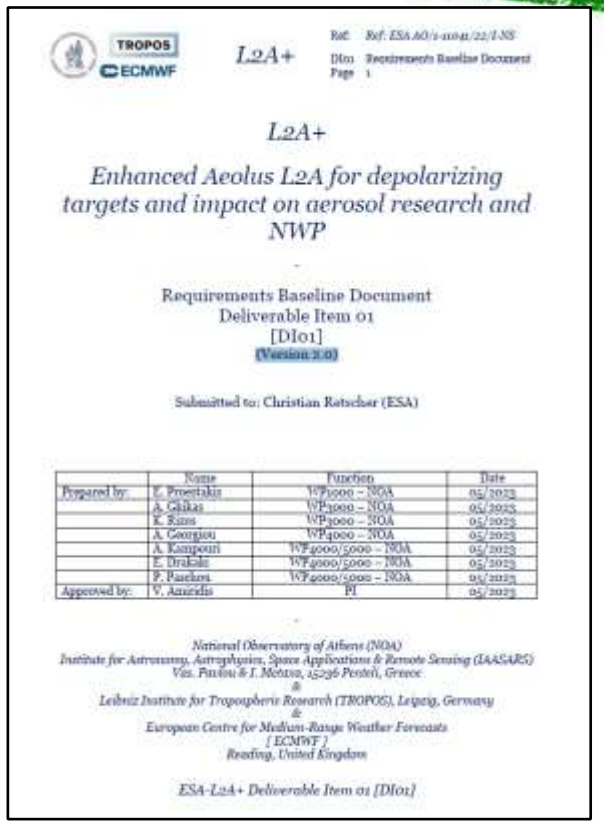
ESA-L2A+ Deliverable Item 01 [DI01]

ESA Review and comments on DI01 - V1

No	ESA Comments	DI01-V2-Section
1	Differences and the upgrades: from L2A to L2A+.	Section 7
2	Considerations on Sentinel5p AOD from PAL.	Section 4.1.6
3	Requirements and uncertainty thresholds, accuracy of the products.	Section 8

SUBMITTED FOR REVIEW

APPROVED



TROPOS ECMWF L2A+ Ref: Ref: ESA AO/1-11041/22/I-NS DI01 Requirements Baseline Document Page 1

L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP

Requirements Baseline Document
Deliverable Item 01
[DI01]
(Version 2.0)

Submitted to: Christian Retscher (ESA)

	Name	Function	Date
Prepared by:	E. Proestakis	WP1000 – NOA	05/2023
	A. Gkikas	WP3000 – NOA	05/2023
	K. Rizos	WP3000 – NOA	05/2023
	A. Georgiou	WP4000 – NOA	05/2023
	A. Kampouri	WP4000/5000 – NOA	05/2023
	E. Drakaki	WP4000/5000 – NOA	05/2023
	P. Paschou	WP4000/5000 – NOA	05/2023
Approved by:	V. Amiridis	PI	05/2023

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ESA-L2A+ Deliverable Item 01 [DI01]

L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

WP1000: *Management, reporting and promotion.*

Enhancing Aeolus L2A for depolarizing targets and impact on aerosol research and NWP

A. Georgiou[1,2], E. Proestakis[1], A. Gkikas[1,3], K. Rizos[1,4], E. Drakaki[1,5], A. Kampouri[1,6], A. Tsikerdekis[7,8], H. Baars[9], A. Floutsi[9], A. Benedetti[10], V. Amiridis[1]

(1) Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing, National Observatory of Athens, Athens, Greece; (2) School of Physics, Faculty of Sciences, Aristotle University of Thessaloniki; (3) Research Centre for Atmospheric Physics and Climatology, Academy of Athens, Athens, Greece; (4) Laboratory of Atmospheric Physics, Aristotle University of Thessaloniki, 54124 5 Thessaloniki, Greece; (5) Harokopio University, Department of Geography, Athens, Greece; (6) Department of Meteorology and Climatology, School of Geology, Aristotle University of Thessaloniki, Thessaloniki, Greece; (7) Earth Group, SRON Netherlands Institute for Space Research, 2333 CA Leiden, the Netherlands; (8) Department of Earth Science, Vrije Universiteit Amsterdam, 1081 HV Amsterdam, the Netherlands; (9) Leibniz Institute for Tropospheric Research (TROPOS), Leipzig, Germany; (10) European Centre for Medium Range Weather Forecasts (ECMWF), Reading, UK.

Presenting author e-mail: eldrakaki@noa.gr.

L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

WP1000: *Management, reporting and promotion.*

! Upcoming !

1. **Rizos, K.**, Gkikas, A., Proestakis, E., Georgiou, T., Amiridis, V., Marinou, E., Donovan, D., Benas, N., Stengel, M., Retscher, C., Baars, H., and Floutsi., A. A.: *"Development and validation of an enhanced aerosol product for Aeolus"*, poster, Aeolus Science Conference 2023, 22-26/03/2023, Rhodes Island.
2. **Georgiou, T.**, Proestakis, E., Gkikas, A., Rizos, K., Drakaki, E., Kampouri, A., Tsikerdekis, A., H. Baars, A. A. Floutsi, E. Marinou, A. Benedetti, W. McLean, C. Retscher, and V. Amiridis.: *"Improvements in Numerical Weather Prediction and Dust Transport modelling through AEOLUS L2A assimilation"*, poster, Aeolus Science Conference 2023, 22-26/03/2023, Rhodes Island.
3. **Gkikas, A.**, Proestakis, E., Dabas, A., Benedetti, A., McLean, W., Flament, T., Marinou, E, Tsikoudi, I., Baars, H., Floutsi, A., A., Amiridis, V., Borde, R.: *"Upgrading Aeolus aerosol observational capabilities towards improving air quality and NWP models"*, Oral, Aeolus Science Conference 2023, 22-26/03/2023, Rhodes Island.
4. **Proestakis, E.**, Gkikas, A., Georgiou, A., Rizos, K., Paschou, P., Benedetti, A., McLean, W., and V. Amiridis, V.: *"Aeolus aerosol observational capability based on CALIPSO"*, poster, Aeolus Science Conference 2023, 22-26/03/2023, Rhodes Island.

L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

WP1000: *Management, reporting and promotion.*

! Upcoming !

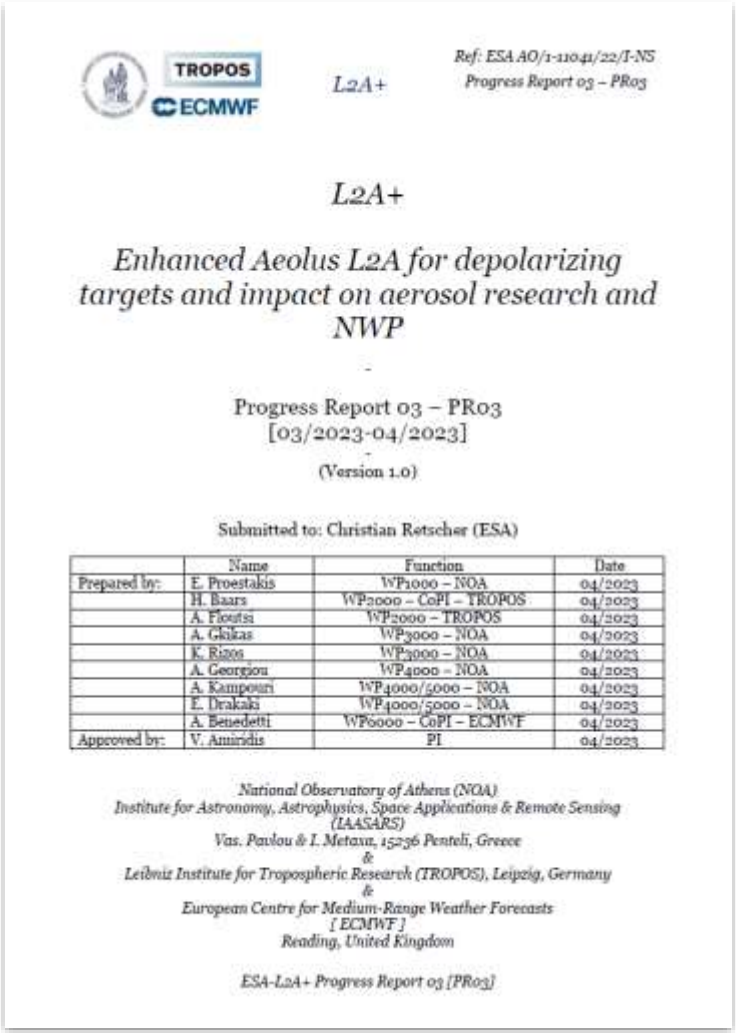
1. **K. Rizos**, A. Gkikas, E. Proestakis, T. Georgiou, V. Amiridis, E. Marinou, D. Donovan, N. Benas, M. Stengel, C. Retscher, H. Baars, and A. A. Floutsi.: "*Development and validation of an enhanced aerosol product for Aeolus (L2A+)*", poster/oral: to-be-announced, COMECAP23 - 25-29/09/2023, Athens, Greece.
2. **T. Georgiou**, E. Proestakis, A. Gkikas, K. Rizos, E. Drakaki, A. Kampouri, A. Tsikerdekis, H. Baars, A. A. Floutsi, E. Marinou, A. Benedetti, W. McLean, C. Retscher, and V. Amiridis.: "*Utilising AEOLUS to improve dust transport modelling*", poster/oral: to-be-announced, COMECAP23 - 25-29/09/2023, Athens, Greece.

L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

WP1000: *Management, reporting and promotion.*

In addition submitted:



TROPOS ECMWF L2A+ Ref: ESA AO/1-11041/22/I-NS Progress Report 03 – PR03

L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP

Progress Report 03 – PR03
[03/2023-04/2023]

(Version 1.0)

Submitted to: Christian Retscher (ESA)

	Name	Function	Date
Prepared by:	E. Proestakis	WP1000 – NOA	04/2023
	H. Baars	WP2000 – CoPI – TROPOS	04/2023
	A. Floutsi	WP2000 – TROPOS	04/2023
	A. Glukas	WP3000 – NOA	04/2023
	K. Rizos	WP3000 – NOA	04/2023
	A. Georgiou	WP4000 – NOA	04/2023
	A. Kampouri	WP4000/5000 – NOA	04/2023
	E. Drakaki	WP4000/5000 – NOA	04/2023
	A. Benedetti	WP6000 – CoPI – ECMWF	04/2023
Approved by:	V. Amiridis	PI	04/2023

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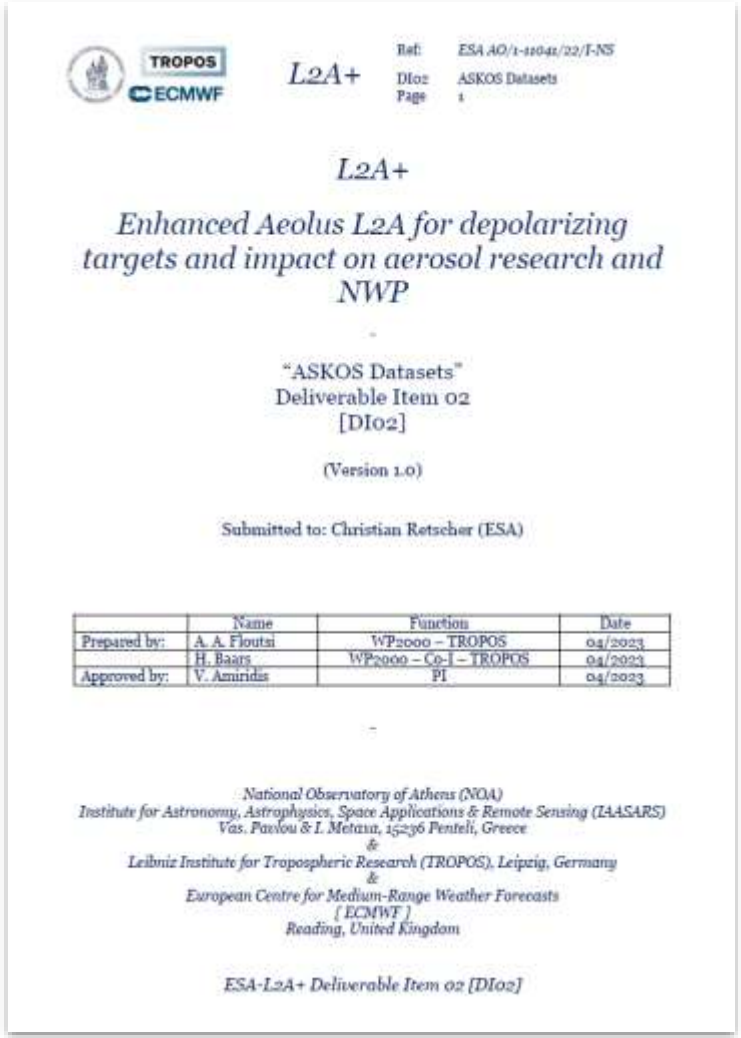
Reading, United Kingdom

ESA-L2A+ Progress Report 03 [PR03]



TROPOS ECMWF L2A+ Ref: ESA AO/1-11041/22/I-NS DI02 ASKOS Datasets Page 1

L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP

"ASKOS Datasets"
Deliverable Item 02
[DI02]

(Version 1.0)

Submitted to: Christian Retscher (ESA)

	Name	Function	Date
Prepared by:	A. A. Floutsi	WP2000 – TROPOS	04/2023
	H. Baars	WP2000 – Co-I – TROPOS	04/2023
Approved by:	V. Amiridis	PI	04/2023

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Reading, United Kingdom

ESA-L2A+ Deliverable Item 02 [DI02]

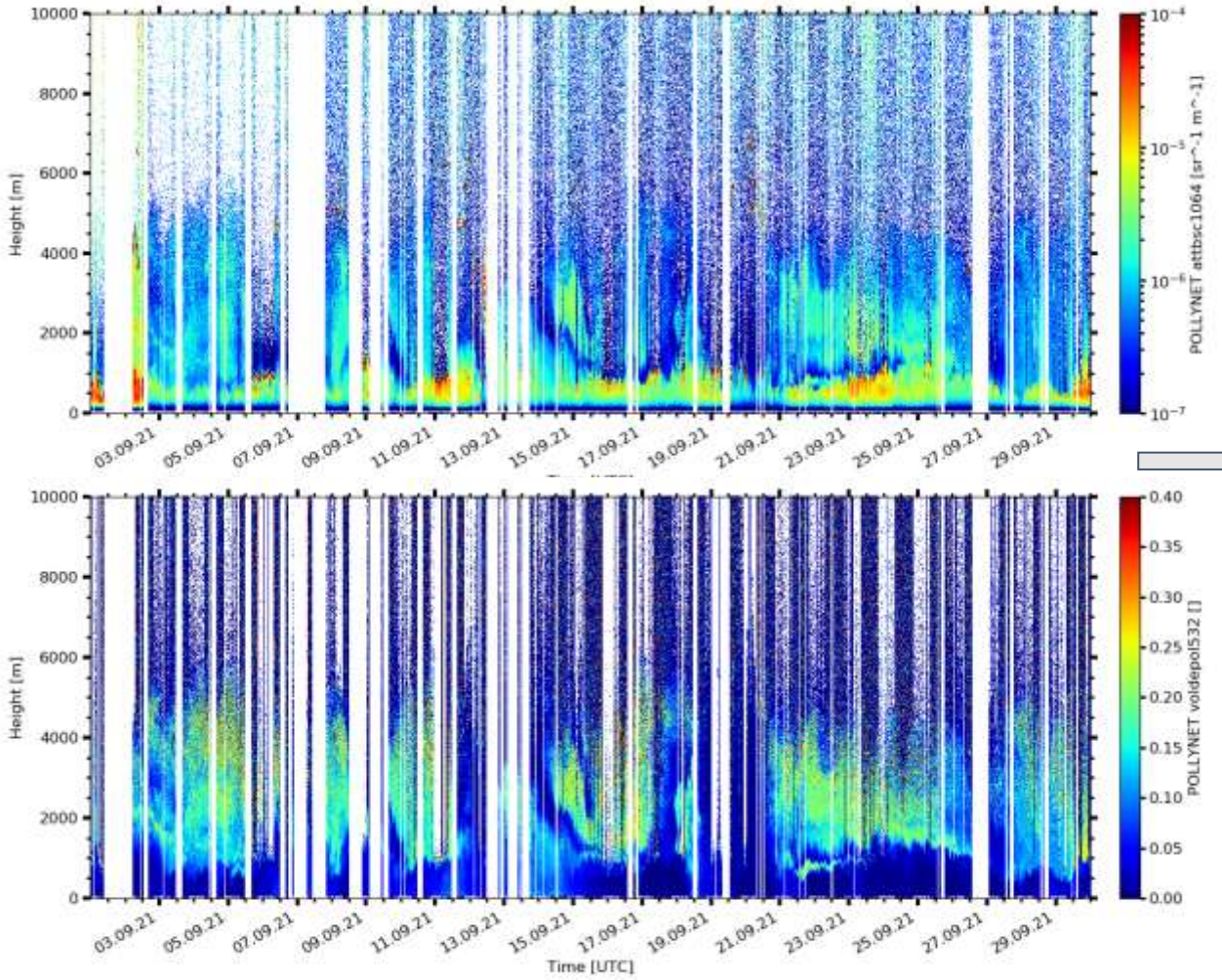
L2A+

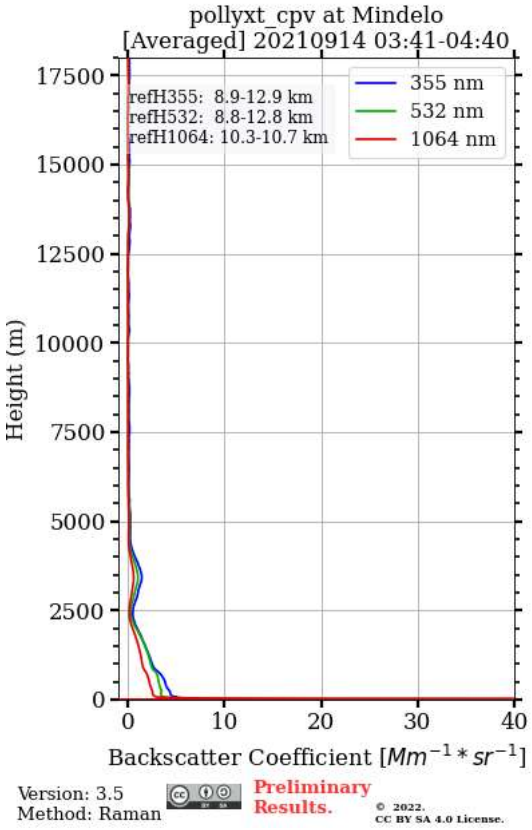
Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

WP2000: *ASKOS ground-based datasets in support of L2A+.*

Objective:	Provide ASKOS ground-based datasets for L2A+ product validation and model evaluation studies
Inputs:	Data acquired during ASKOS as part of the Joint Tropical Atlantic campaign (JATAC). All data has already been collected, but the analysis and exploitation has not yet been intensified or completed.
Tasks:	• Creation of a unique feature mask (Combined Cloudnet + EARLINET lidar target categorisation) • Application of the well-established Poliphon method to estimate the vertical resolved dust fraction • Application of an EarthCARE-like (HETEAC-Flex) typing scheme on the data from ground-based lidar in Mindelo to retrieve the volume concentration of mineral dust • Extraction of Aeolus-like profiles taken by the Aeolus reference instrument eVe •Use of the vertical wind information obtained with Doppler lidar and radar to estimate dust flux
Output:	•D2: Data set of feature mask over Mindelo for September 2021 including aerosol optical properties; Documentation on time series of profiles of wind speed over Mindelo and radiosonde profiles obtained at Sal. • D4: Analysis of Aeolus-like optical properties for Aeolus overpasses for validating/evaluating the new retrievals • D5: Final data set on the height-resolved dust-only profiles above Mindelo, Cabo Verde

Aerosol optical properties for September 2021





Total number of optical profiles: 429

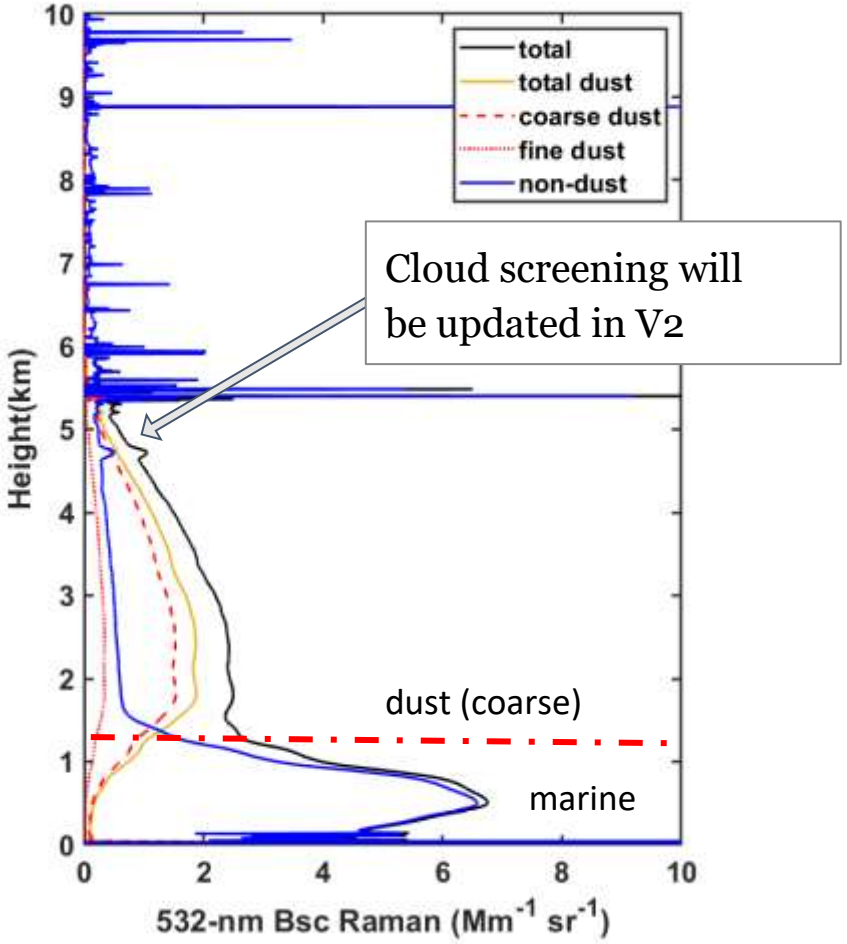
L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

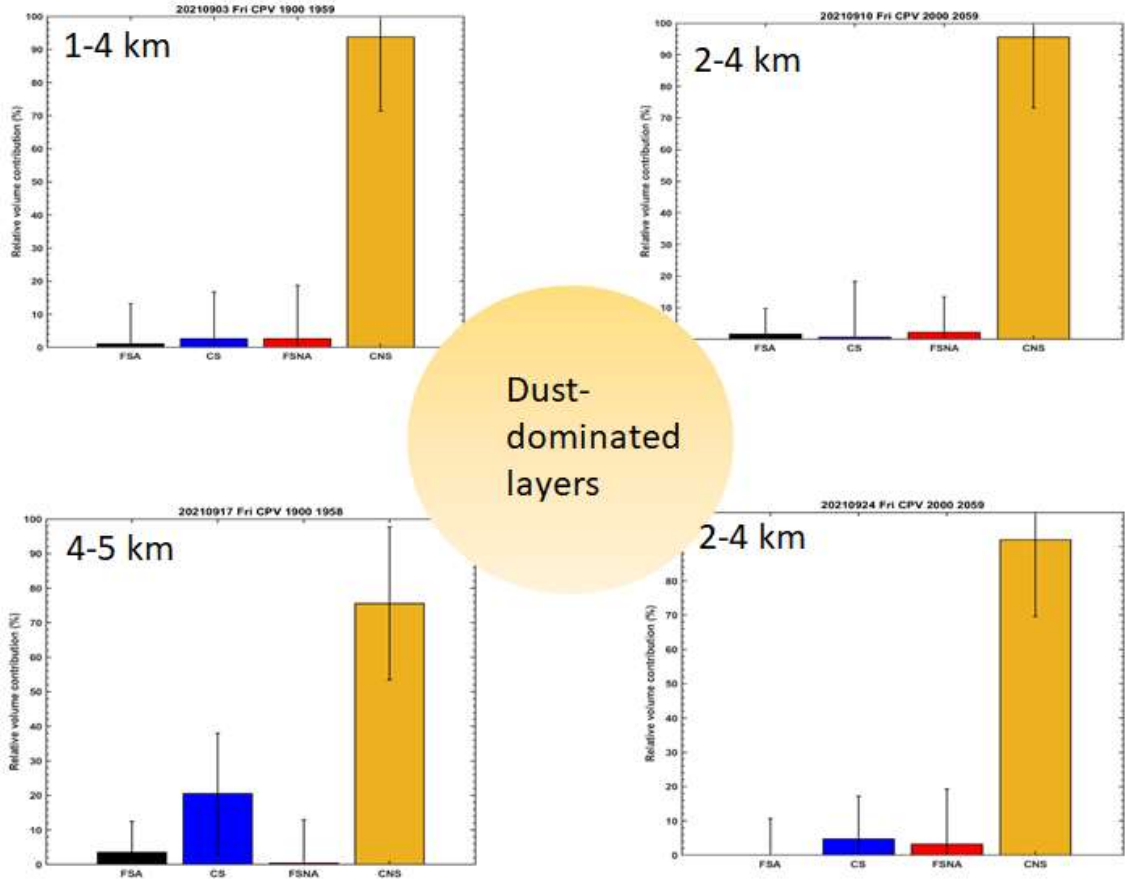
WP2000: *ASKOS ground-based datasets in support of L2A+.*

Based on the optical profiles → POLIPHON

Dust- only vertically- resolved aerosol properties for Sep 2021 (V1)



HETEAC- Flex: available for the Aeolus Friday overpasses (for now)



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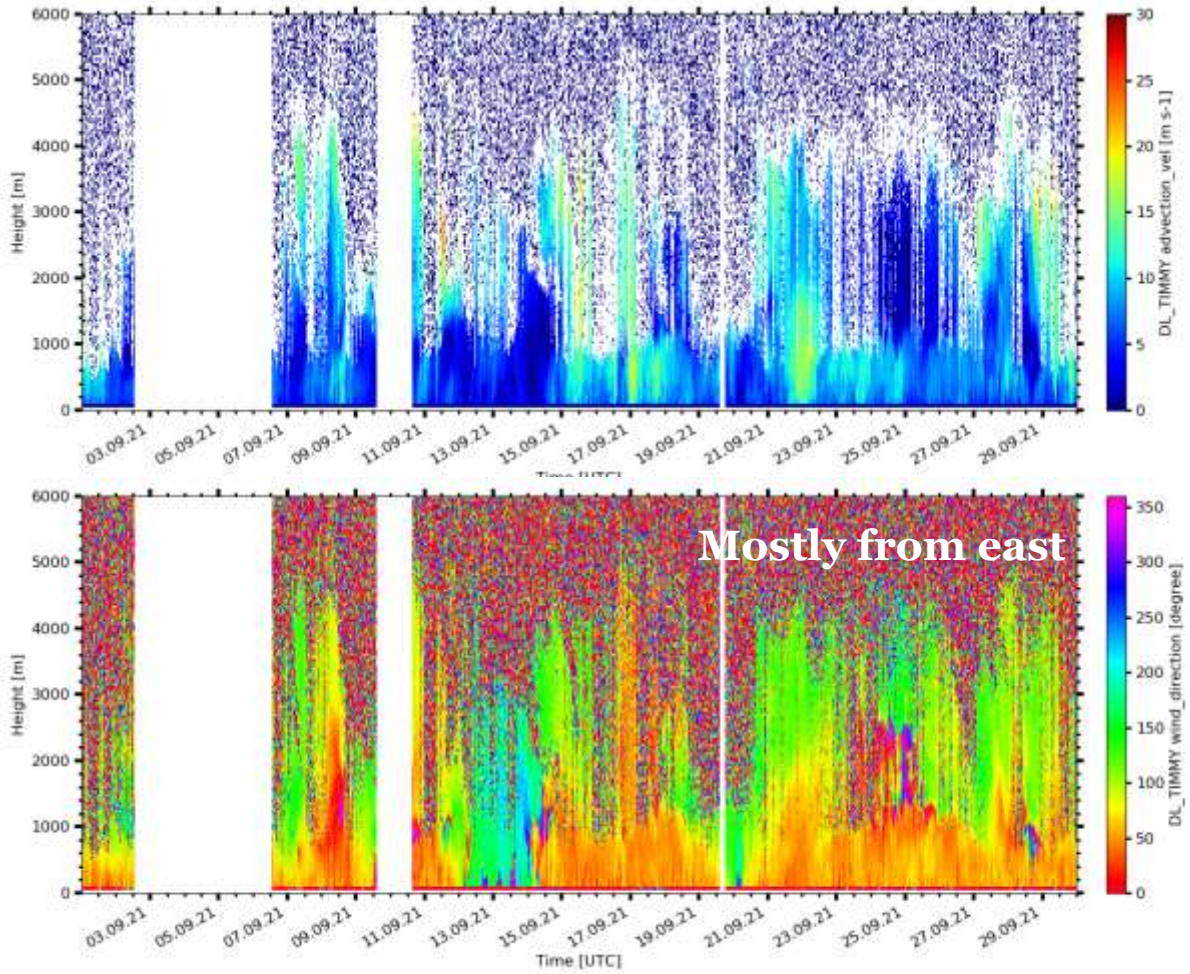
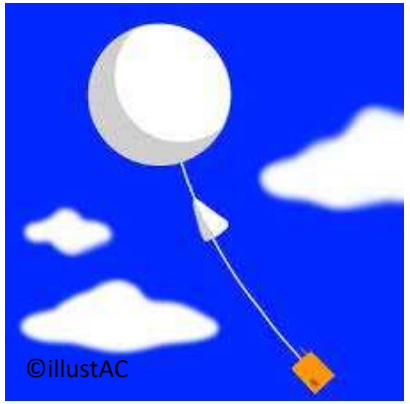
WP2000: *ASKOS ground-based datasets in support of L2A+.*

Wind speed and direction

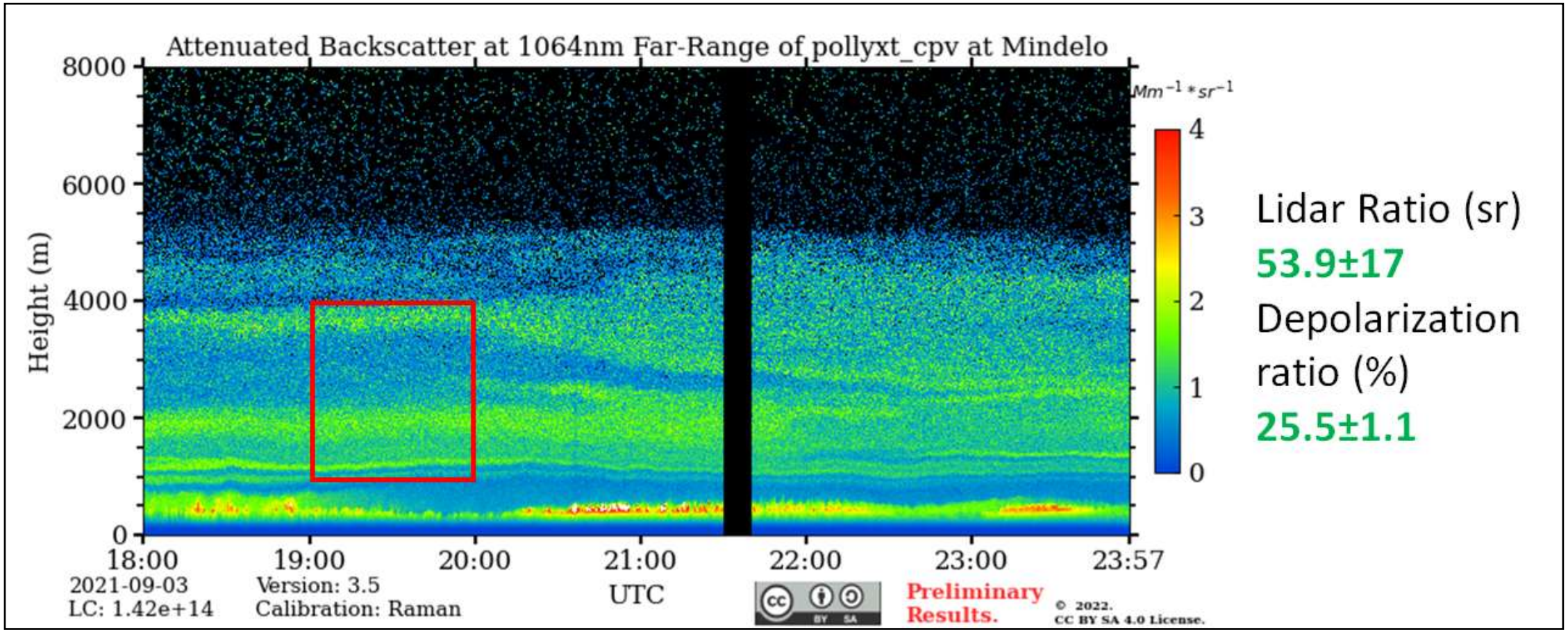


Radiosondes at SAL

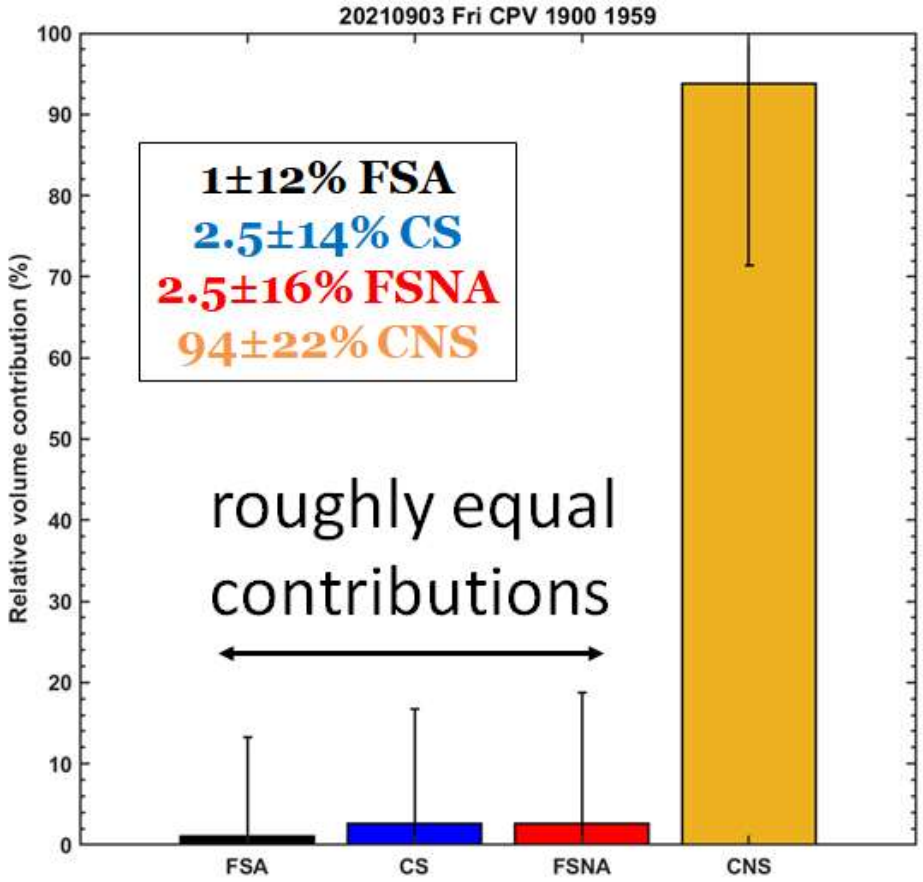


Weekday	Radiosonde release time [UTC]
Monday	06:40, 10:45
Tuesday	06:50, 10:45
Wednesday	07:00, 10:45
Thursday	18:50, 10:45
Friday	19:00, 10:45
Saturday	10:45
Sunday	10:45

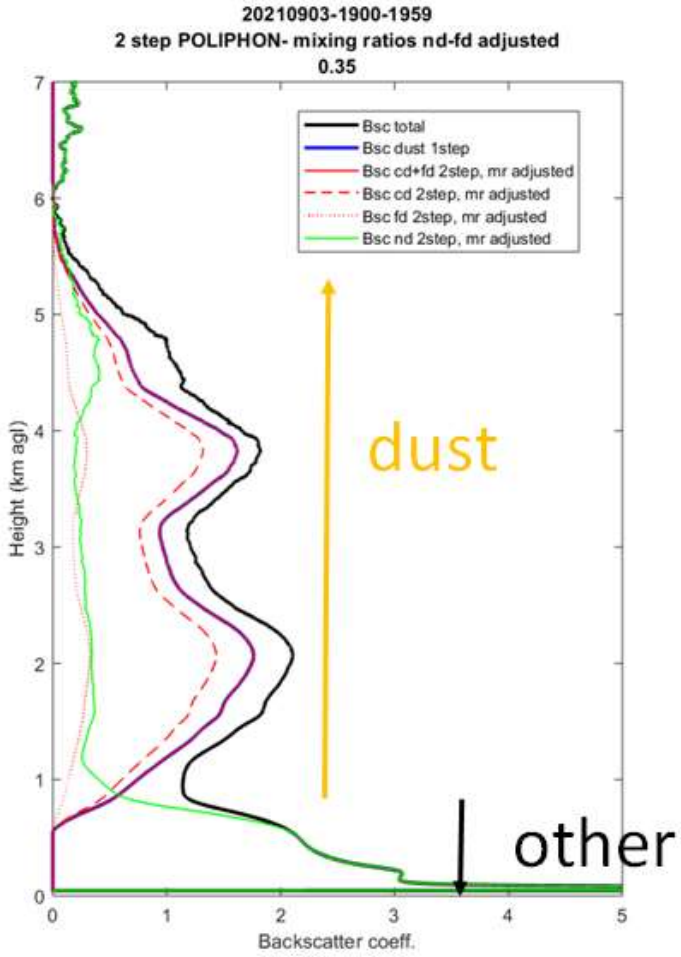
Fri 03.09.2021 – Optical properties



03.09.2021 – HETEAC- Flex & POLIPHON



R_{eff} = 1.3 ± 0.3 µm



WP2000: *ASKOS ground-based datasets in support of L2A+.*

Summary & status of WP2000

- V1 Askos Datasets (DI02) delivered
  - PollyXT-derived aerosol optical properties and target classification (September 2021)
  - Cloudnet target classification (September 2021)
  - 2-step POLIPHON results, including among others the dust-only vertical profiles of the extinction and backscatter coefficient, the dust mass concentration, etc. (September 2021) (was planned for KO +12)
  - HETEAC-Flex typing results for the four Aeolus overpasses during September 2021 (03, 10, 17, 24), which include the relative volume contributions of four aerosol components, the volume and number concentration (per component) , etc.
  - Radiosonde profiles obtained at Sal
- Improvements to V2 include: cloud screening
- Combined feature mask over Mindelo (September 2021) is still work-in-progress and will be based on the PollyXT-derived aerosol optical properties and target classification (September 2021) and Cloudnet target classification (September 2021) delivered within D2

L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

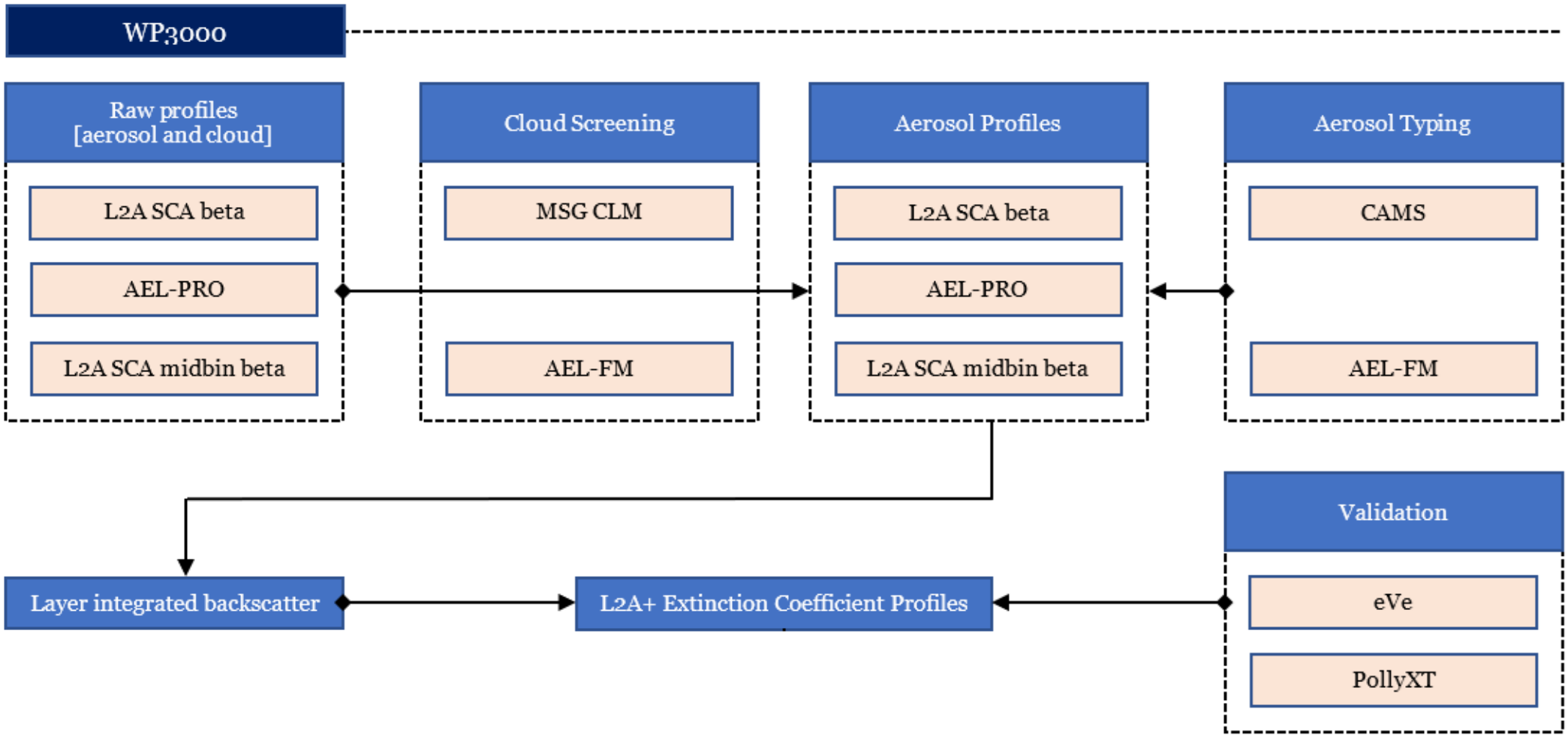
WP3000: *Development of the L2A+ aerosol product.*

Objective:	**Derivation of the L2A+ extinction and aerosol mass concentration product**
Inputs:	Aeolus L2A profiles, AEL-FM/PRO, SEVIRI CLAAS-3 cloud dataset, CAMS
Tasks:	1. **Implementation of a rigorous screening of cloud contaminated Aeolus profiles** via the synergy of AEL-FM retrievals and MSG geostationary cloud imagery 2. **Exploitation of CAMS vertically resolved aerosol typing** for identifying the vertical extension of dust layers within the RoI 3. **Reconstruction of Aeolus cloud-free dust extinction profiles** by adjusting the absent cross-polar backscatter and defining suitable dust lidar ratio(s) 4. **Assessment analysis of Aeolus L2A+ aerosol profiles**
Output:	• D3: Description of the Algorithm Developments (ALGO) • D4: Analysis of the Validation Activities carried out (VAL) • D5: Output data product (OP)

L2A+

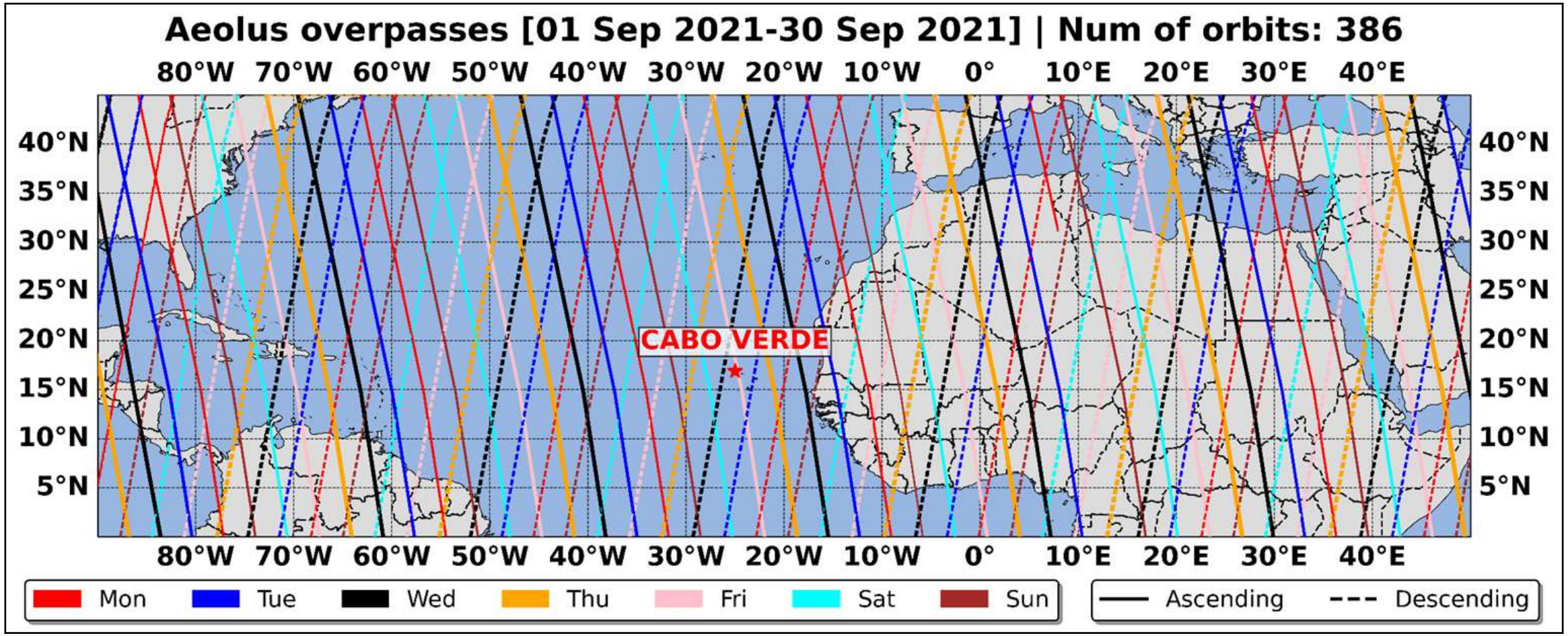
Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

WP3000: *Development of the L2A+ aerosol product.*



WP3000: *Development of the L2A+ aerosol product.*

Aeolus overpasses within the RoI over the study period (September 2021)



L2A+

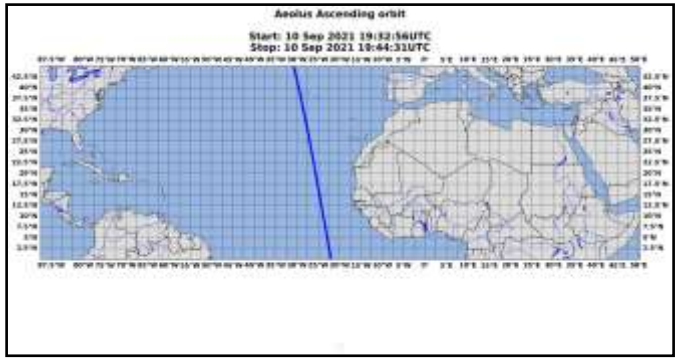
Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

WP3000: *Development of the L2A+ aerosol product.*

Raw profiles [aerosol and cloud]

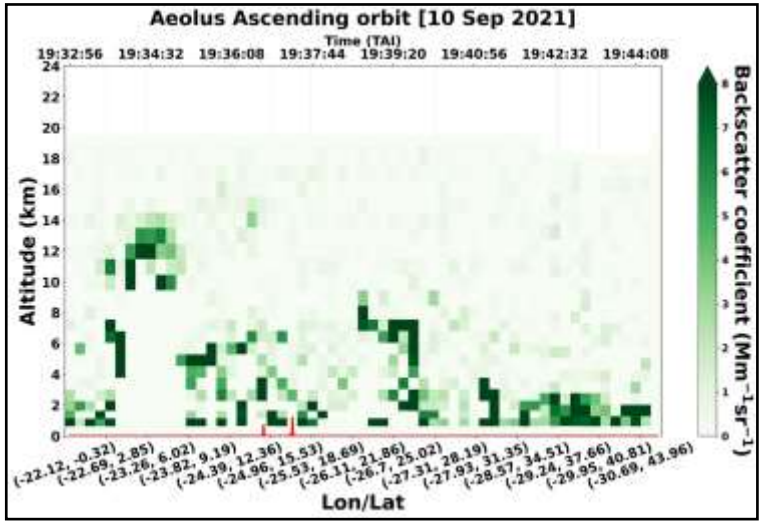
- L2A SCA beta
- AEL-PRO
- L2A SCA midbin beta

Aeolus raw SCA-ray and SCA-midbin profiles

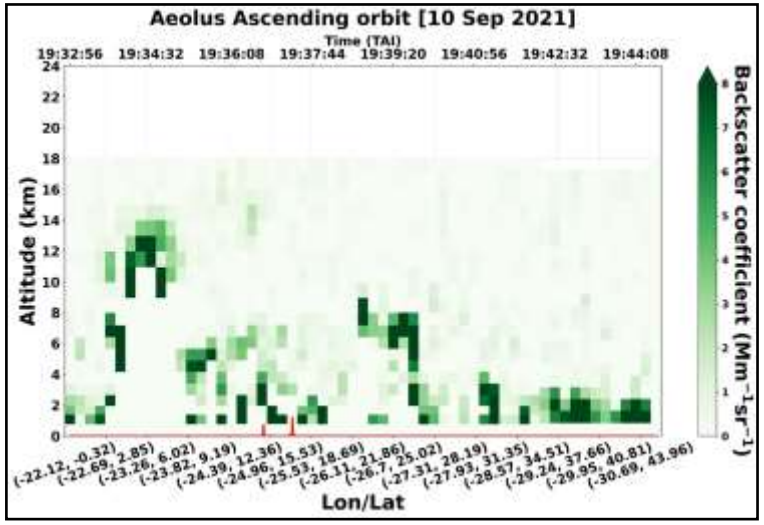


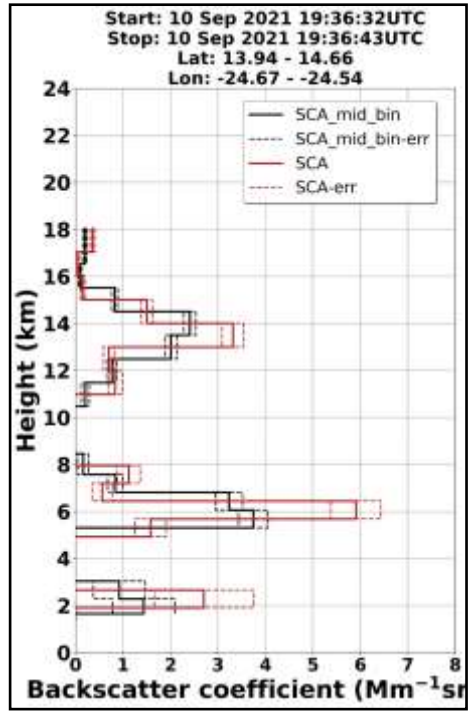
Orbit no. 017679 (10 Sep 2021)

SCA-ray [24 bins]



SCA-midbin [23 bins]





L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

WP3000: *Development of the L2A+ aerosol product.*

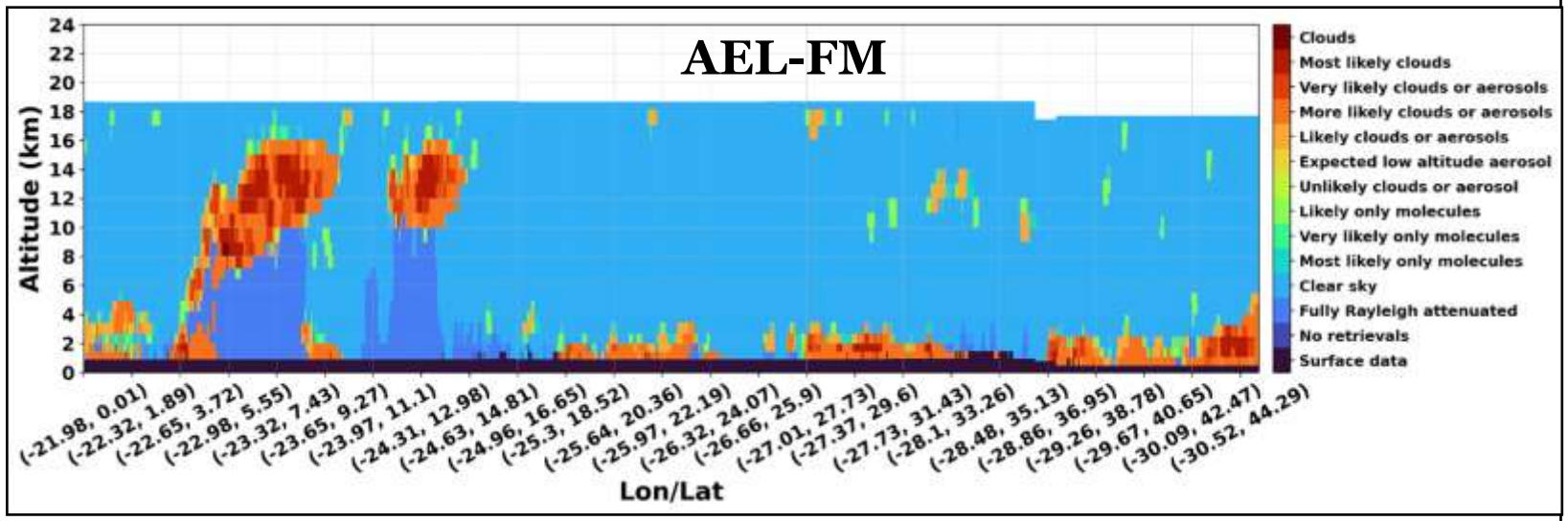
Cloud Screening

- MSG CLM
- AEL-FM

Removal of cloud-contaminated profiles via the synergy with AEL-FM

- AEL-FM product for September 2021 period will be provided for the needs of the L2A+ study -Contribution by Dave Donovan (KNMI).
- The development analysis is focused on three indicative Aeolus-Cabo Verde overpasses, specifically on the 10th, 17th, and 24th of September 2021.
- Waiting for the Aeolus retrievals processed with the latest L2A processor version (Baseline 16) for the study period of September 2021 (AEL-FM included)
- The AEL-FM feature mask product for a study case on 17 September 2021 is presented below.

Orbit no. 017790 (17 Sep 2021)



L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

WP3000: *Development of the L2A+ aerosol product.*

Cloud Screening

- MSG CLM
- AEL-FM

Cloud-Screening Methodology based on AEL-FM dataset

Step 1

AEL-FM data provided at Measurement level

2	2	4	4	-3	1	-2	-2	1
1	6	1	-1	1	3	-3	2	4
2	5	10	6	9	4	-2	-3	7
10	3	7	5	4	10	-1	8	2
2	-3	10	-2	6	5	-2	1	0
-2	8	4	7	3	6	7	3	8
7	1	0	6	9	5	0	-2	10
-2	2	-2	-1	-2	5	0	2	2
-1	5	0	3	3	-1	3	0	10

24 layers

Total number of measurements = 9 in this case

1 BRC level comprised of 3 measurements in this example

Step 2

Selection of features to be flagged

Index	Definition
10	Clouds
9	Most likely clouds
8	Very likely clouds or aerosols
7	More likely clouds or aerosols
6	Likely clouds or aerosols
5	Expected low altitude aerosol
4	Unlikely clouds or aerosol
3	Likely only molecules
2	Very likely only molecules
1	Most likely only molecules
0	Clear sky
-1	Fully Rayleigh attenuated
-2	No retrievals
-3	Surface data

AEL-FM features index definition

Step 3

Cloud-flagged AEL-FM data at Measurement level

0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0
0	0	1	1	1	0	0	0	1
1	0	0	0	0	1	0	1	0
0	0	1	0	1	0	0	0	0
0	1	0	1	0	1	1	0	1
1	0	0	1	1	0	0	0	1
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	1

Step 4

Percentage (%) of cloud-flagged measurements in each BRC bin

0%	0%	0%
33,3%	0%	0%
33,3%	66,6%	33,3%
33,3%	33,3%	33,3%
33,3%	33,3%	0%
33,3%	66,6%	66,6%
33,3%	66,6%	33%
0%	0%	0%
0%	0%	33%

24 layers

3 BRC levels

Set a percentage threshold value above which all the BRC bins will be eliminated: 0% in this case

Step 5

Final cloud-masked product at BRC level

0%	0%	0%
33,3%	0%	0%
33,3%	66,6%	33,3%
33,3%	33,3%	33,3%
33,3%	33,3%	0%
33,3%	66,6%	66,6%
33,3%	66,6%	33%
0%	0%	0%
0%	0%	33%

L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

WP3000: *Development of the L2A+ aerosol product.*

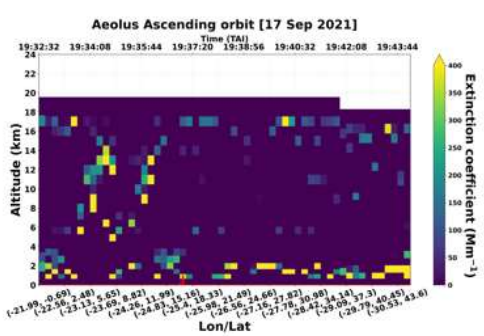
Cloud Screening

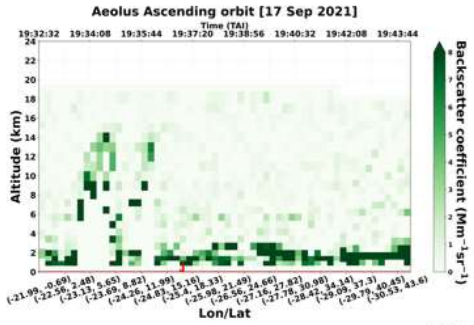
- MSG CLM
- AEL-FM

Cloud-Screening Results for 17 September 2021

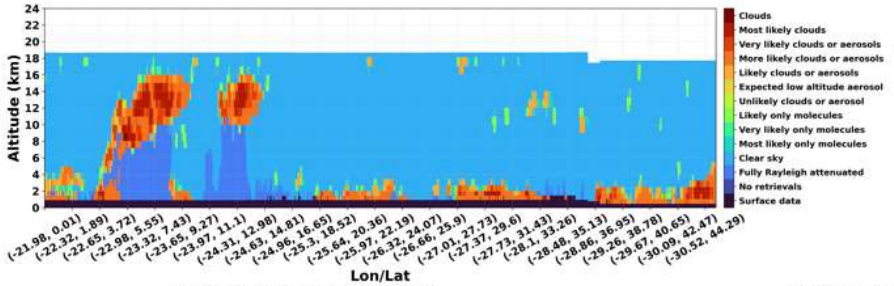
Orbit id: 017790

SCA

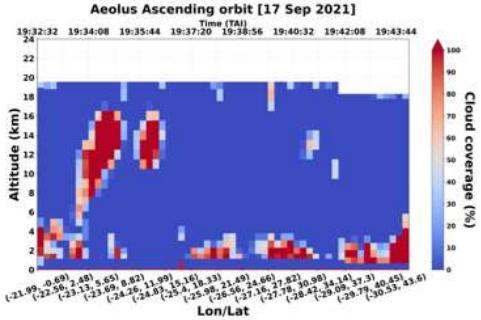




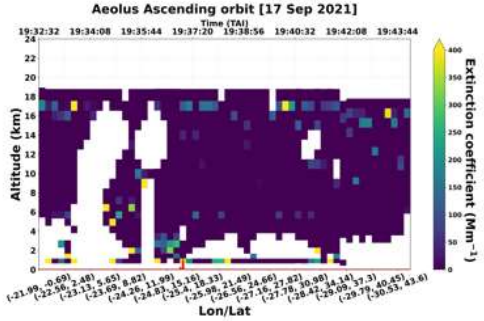
Cloud Mask

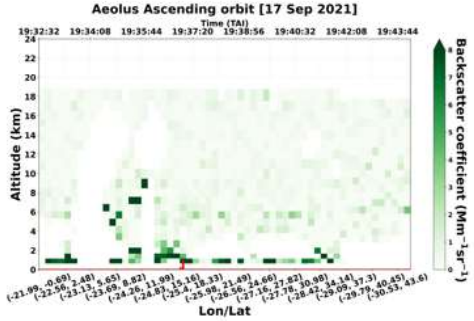


AEL-FM Conversion to BRC level



SCA Cloud-Free





L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

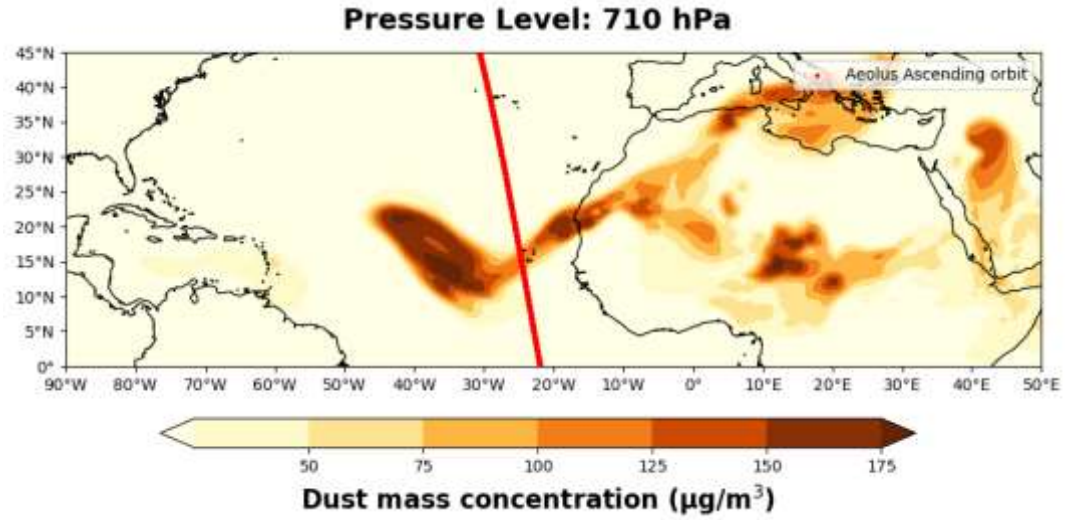
WP3000: *Development of the L2A+ aerosol product.*

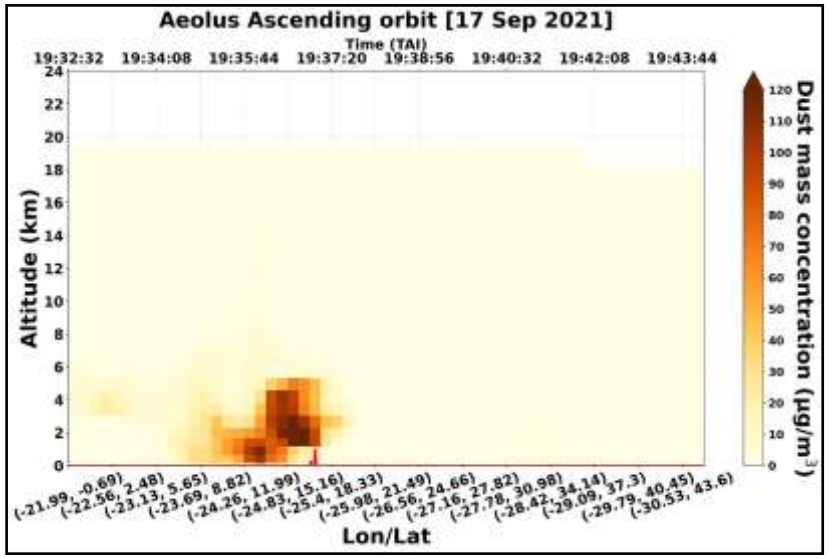
- Aerosol Typing
  - CAMS
  - AEL-FM

Aerosol Typing using CAMS

- Gridded data for dust aerosols were downloaded for the entire ROI and for the period of September 2021, with an horizontal of 0.5°x0.5°, 60 hybrid sigma-pressure model levels in the vertical and a temporal resolution of 3h.
- From the CAMS dataset, the closest grid cells to the Aeolus measurement track were selected
- An indicative study case is provided in the figure-below, for the test case on 17th September 2021 (orbit id: 017790). CAMS dust mass concentration over L2A+ RoI for the 17th of September 2021 at 21:00 h UTC at 710hPa (left figure), and vertical profiles of dust mass concentration along the Aeolus orbit (id: 017790) on 17th of September 2021.

❑ **Next steps: 1) Identification of the dust layers, 2) Extraction of the dust contaminated and cloud-free Aeolus profiles**





L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

WP3000: *Development of the L2A+ aerosol product.*

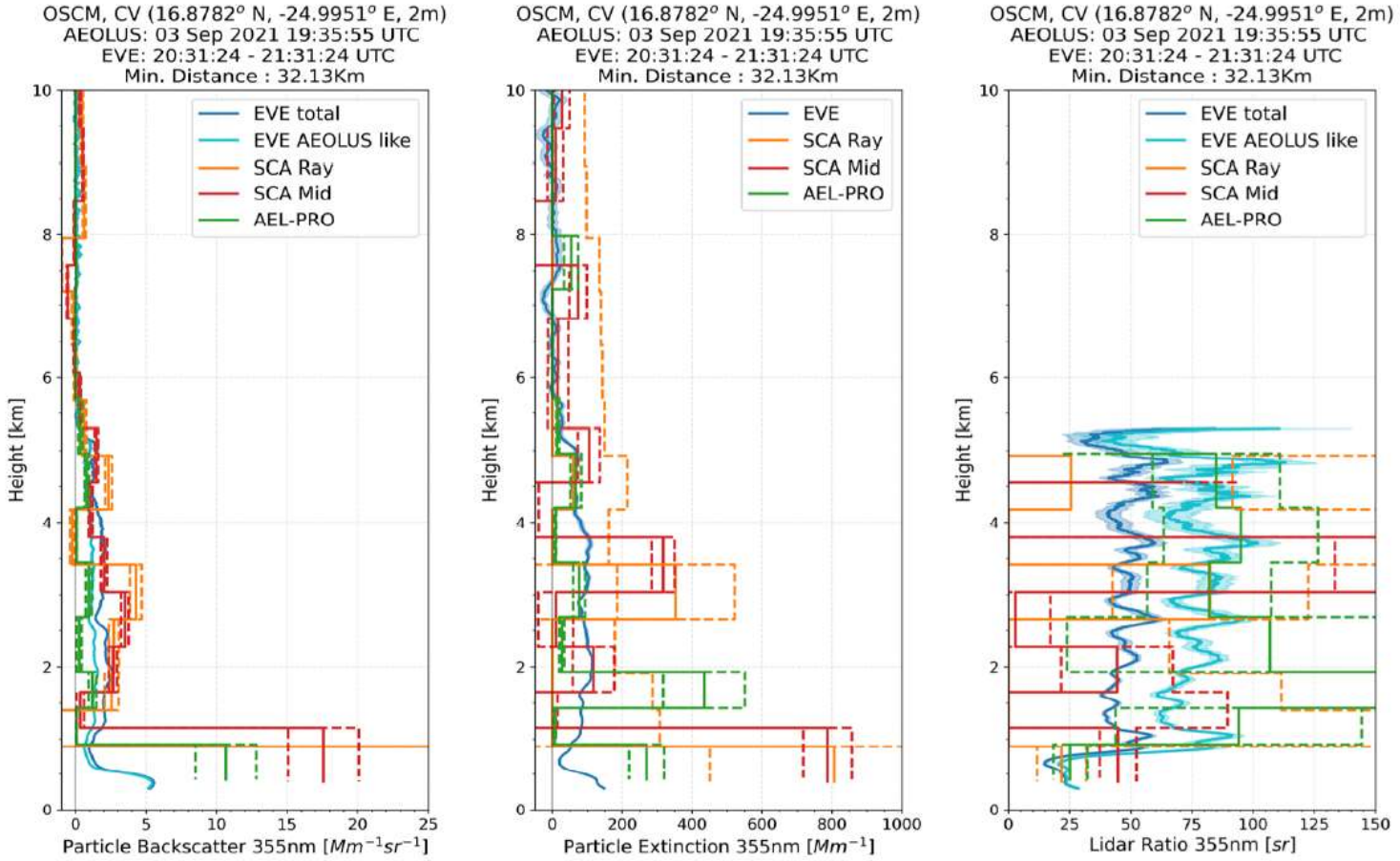
Validation

- eVe
- PollyXT

L2A+ Extinction Coefficient Profiles

Assimilation Methodology WP4000

Evaluation of Aeolus L2A+ aerosol (dust) profiles versus eVe and Polly^{XT}



Courtesy Peristera Paschou [NOA]

WP4000: *Assimilation of L2A/L2A+ and application of WRF-L experiments.*

Objective:	Assimilation of L2A/L2A+ and application of WRF-L experiments.
Inputs:	1) Aeolus L2A and L2A+ dust profiles from WP3000 2) ECMWF IFS wind fields with /without Aeolus assimilation (available from ECMWF)
Tasks:	1) Development of data assimilation routines (DART) 2) Evaluation of assimilation methodology 3) Performance of short term dust and NWP forecasts with WRF model.
Output:	DI03: Description of the Algorithm Developments (ALGO) for assimilating Aeolus L2A and L2A+. DI05: WRF simulation outputs for all experiments.

L2A+

Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP.

WP4000: *Assimilation of L2A/L2A+ and application of WRF-L*

Work package begun in May 2023

As a preparatory step, we are working on AEOLUS wind assimilation into the regional NWP model WRF:

- Simpler model - no chemistry
- Straightforward operators

When the workflow of WRF/DART is established and tested, we will move onto L2A assimilation.