L2A+ ECMWF TROPOS Leibniz Institute for Tropospheric Research

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

L2A+

Progress Meeting 01 [PM01]

Minutes of Meeting
[07/02/2023]
[11:00-12:30 CET]

	Name	Function	Date
Prepared by:	E. Proestakis	Post-Doc researcher	08/02/2022
Approved by:	V. Amiridis	PI	08/02/2022

Meeting Attendance List

The participants who attended the L2A+ Progress Meeting 01 (PM01) from ESA, NOA, TROPOS, and ECMWF, encompassed by participants from KNMI are listed below, in "Table 1".

Table 1: List of Participants in L2A+ KO meeting.

Nr.	Participant	Affiliation	Email
1	Vassilis Amiridis	NOA	vamoir@noa.gr
2	Emmanouil Proestakis	NOA	proestakis@noa.gr
3	Antonis Gkikas	NOA	agkikas@noa.gr
4	Athanasios Georgiou	NOA	ageorgiou@noa.gr
5	Anna Kampouri	NOA	akampouri@noa.gr
6	Kostas Rizos	NOA	k.rizos@noa.gr
7	Eleni Drakaki	NOA	eldrakaki@noa.gr
8	Holger Baars	TROPOS	baars@tropos.de
9	Athena Floutsi	TROPOS	floutsi@tropos.de
10	Angela Benedetti	ECMWF	Angela.Benedetti@ecmwf.int
11	Will McLean	ECMWF	Will.McLean@ecmwf.int
12	Athanasios Tsikerdekis	KNMI	thanos.tsikerdekis@knmi.nl
13	Christian Retscher	ESA	Christian.Retscher@esa.int
14	Daniele Gasbarra	ESA	Daniele.Gasbarra@esa.int
15	Kristof Rose	ESA	

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Brief Description

On February 7, 2023, between 11:00 and 12:30 CET, via videoconference a meeting between the European Space Agency (ESA) and the scientific groups of the "Enhanced Aeolus L2A for depolarizing targets and impact on aerosol research and NWP" (L2A+) was held, with the objective to provide information on the progress of the L2A+ ESA-activity. During the meeting, the agenda included an introduction by Christian Retscher (ESA) and Vassilis Amiridis (NOA), and an overview, recap of the science goals, methods and datasets to be used in L2A+, by Emmanouil Proestakis. In addition, PM01 included (1) an overview of WP2000 – "ASKOS ground-based datasets in support of L2A+" by Holger Baars (TROPOS) and Athena Floutsi (TROPOS), of WP3000 – "Development of the L2A+ aerosol product" by Konstantinos Rizos (NOA), and of WP4000 – "Assimilation of L2A/L2A+ and application of WRF-L experiments" by Athanasios Georgiou (NOA).

Discussion and Outcomes

During Progress Meeting 01 (PM01) E. Proestakis provided an extensive overview of activities held within the T_0 – T_0+3 months of L2A+ period, having as a starting point the general L2A+ project objectives and considerations. Accordingly, followed introduction of the working groups and members composing the L2A+ project was and presentation of L2A+ Work Breakdown Structure (WBS) with respects to the different Working Groups (WGs) and the corresponding included tasks. The presentation of the general introduction was concluded by presentation of the current state of L2A+, with respect to the L2A+ Gantt Chart and the Work Packages (WPs) that have started within the PR01 period, including some preparatory steps of WPs to be initiated in the near future. The presentation and provided information on the status of L2A+ were considered by the Agency sufficient.

WP1000 and "L2A+ Overview". Presenter: E. Proestakis

E. Proestakis provided an extensive overview of L2A+ activities to be performed in the framework of the project, and in addition an overview of the activities performed between T_0 – T_0+3 months of L2A+ period with respect to WP1000. The presentation provided introduction of the (1) background, scientific and technical overarching project objectives and considerations, (2) on the challenges behind the L2A product to be tackled in the 2-year period of the project, (3) presentation of L2A+ Gantt Chart, Work Logic, Working Groups, and (4) finally an overview of the Work Packages. The presentation of the general overview was concluded by presentation of WP1000 – "Management, reporting and promotion" and the status of the Deliverable Items (DIs). The overview included information on DI01 – "Requirements Baseline Document" and DI07 – "Project Website". Finally, the presentation included information on the participation in conferences with respect to the dissemination of L2A+ (i.e., EGU23 and Rodos Aeolus Conference 2023).

WP2000 "ASKOS ground-based datasets in support of L2A+". Presenter: A. Floutsi.

A. Floutsi provided an extensive overview of the activities to be performed within L2A+ WP2000 – "ASKOS ground-based datasets in support of L2A+", with the objective to review the datasets acquired during ASKOS as part of the Joint Tropical Atlantic campaign (JATAC) and ASKOS Campaign, and of the datasets that have been collected, and the ongoing analysis and exploitation towards completion of L2A+ dataset pre-processing. The presentation provided an overview of the ACTRIS Aerosol and Cloud Remote Sensing facilities operating in the September 2021 campaign phase, while a preliminary analysis on the ASKOS atmospheric conditions over Mindelo-

Cabo Verde based on PollyXT, Cimel, and Wind Lidar observations was also discussed. In addition, the presentation included an initial overview of the three periods with different characteristic atmospheric conditions, (1) a very homogenous dust layering with high AOD, (2) a complex horizontal and vertical dust structure (combined with pollution), and finally (3) the influence of volcanic eruption from La Palma. The presentation included an indicative example of the analysis performed, for the 10th of September 2021 with respect to PollyXT backscatter coefficient, Particulate Depolarization Ratio, Lidar Ratio, Extinction Coefficient and Angstrom Exponent for probed dust and marine atmospheric layers. The presentation provided input on the implemented HETEAC-FLEX algorithm for aerosol classification and target categorization, a significant step towards the developments of feature mask based on a synergy of CLOUDNET and EARLINET. Finally, the presentation provided initial results from the ongoing implementation of one/two step POLIPHON algorithm and on the effort to estimate dust flaxes over Mindelo-Cabo Verde. The provided information on WP2000– "ASKOS ground-based datasets in support of L2A+" were considered sufficient by the Agency.

WP3000 "Derivation of the L2A+ extinction and aerosol mass concentration product". Presenters: K. Rizos.

K. Rizos provided an extensive overview of the activities to be performed within L2A+ WP3000 – "Derivation of the L2A+ extinction and aerosol mass concentration product", though WP3000 has not officially Kicked Off at PM01. K. Rizos provided the overview of WP3000, the Inputs required, the Tasks included, and the Outputs/DIs expected. The presentation provided information (1) on the foreseen Work Flow of L2A+ dust aerosol product, (2) the foreseen and challenges related to L2A+ Region of Interest (RoI), (3) the L2A SCA-ray and SCA-midbin products, and (4) the foreseen removal of cloud contaminated profiles via the synergy with MSG cloud imagery and the removal of cloud contaminated profiles via the synergy with AEL-FM, while the Aerosol typing on Aeolus profiles relying on CAMS outputs was also presented. Finally, K. Rizos provided information on the foreseen L2A+ evaluation activities of Aeolus L2A+ aerosol (dust) profiles versus eVe and PollyXT. The provided information on WP3000– "Derivation of the L2A+ extinction and aerosol mass concentration product" progress overview / preparatory steps were considered sufficient by the Agency.

WP4000 "Assimilation of L2A/L2A+ and application of WRF-L experiments". Presenter: Athanasios Georgiou.

A. Georgiou provided an extensive overview of the activities to be performed within L2A+ WP4000 – "Assimilation of L2A/L2A+ and application of WRF-L experiments", though WP4000 has not officially Kicked Off at PM01. More specifically, A. Georgiou provided the overview of WP4000, the Inputs required, the Tasks included, and the Outputs/DIs expected. The presentation included information on the process towards the overall assimilation of L2A/L2A+ and application of WRF-L experiments, the development of data assimilation routines (DART), evaluation of assimilation methodology, and the performance of short-term dust and NWP forecasts with WRF model. The presentation focused on NCAR|DART for Data Assimilation toolkit, describing the various ensemble assimilation algorithms that are already implemented, including the Ensemble Adjustment Kalman Filter (EAKF). Finally, A. Georgiou reported on the ongoing activities towards ensuring additional computational resources that will be required for the assimilation

experiments, through efforts to obtain computational resources on the National HPC Facility ARIS. More specifically, A. Georgiou provided an overview of the (1) preparatory access acquired to National HPC Facility ARIS to test WRF performance and scalability, and (2) on the project proposal that is submitted to request for 2m core hours for assimilation experiments, for the L2A+ project. The provided information on WP4000– "Assimilation of L2A/L2A+ and application of WRF-L experiments" progress overview / preparatory steps were considered sufficient by the Agency.

Main Concluding Points

- The project, although in its early stages, is considered progressing properly.
- The ESA L2A+ Officers informed the consortium on the review comments of the submitted DI01 and DI02, to be provided to L2A+ consortium in the following to PM01 weeks with the aim to address them prior re-submission of the second version, according to L2A+ Gantt Chart.