Deliverable D2.11: Third report on technical upgrades and QA activities at EARLINET and Cloudnet stations

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This report summarizes the status of ACTRIS aerosol and cloud profiling stations during the third year of the ACTRIS-2 project. A map of EARLINET and Cloudnet stations is shown in Fig. 1. Station IDs are related to the full station names in Tab. 1. Reporting sheets summarizing the status of instrumentation, data delivery, upgrades, and performed quality checks of all EARLINET and Cloudnet stations are provided in Sec. 1 and 2, respectively. Sec. 3 gives an overview on the required QA tests for EARLINET stations.

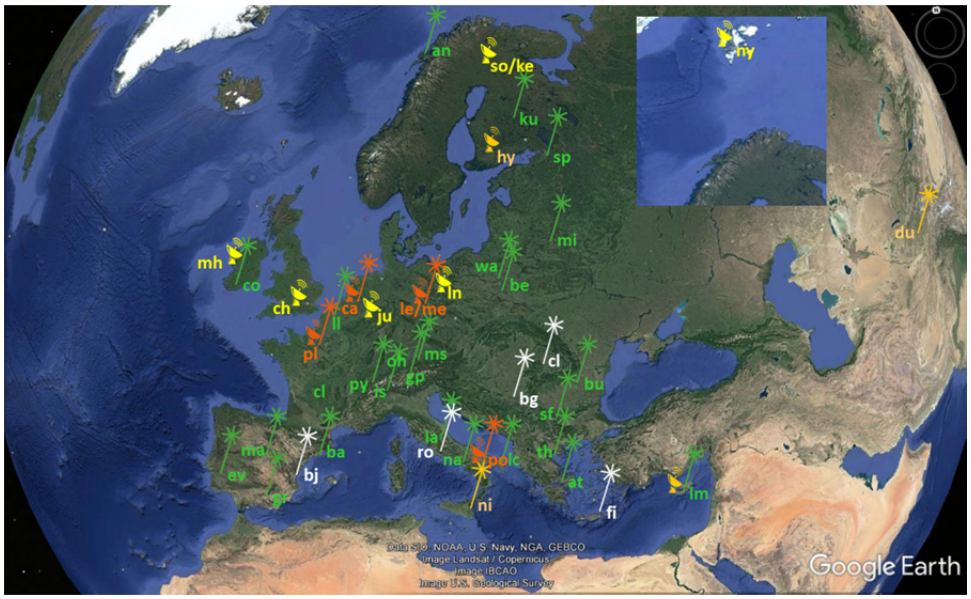

Fig. 1: Map of EARLINET and Cloudnet stations. Orange: combined EARLINET/Cloudnet stations, yellow: Cloudnet stations, green: permanent EARLINET stations, dark yellow: non-permanent stations, white: joining EARLINET stations.

Tab. 1: EARLINET and Cloudnet station IDs and full names

EARLINET permanent stations					
an	Andoya	at	Athens	ba	Barcelona
be	Belsk	bu	Bucharest	ca	Cabauw
cl	Clermont-Ferrand	co	Cork	ev	Evora
gp	Garmisch-Partenkirchen	gr	Granada	is	Ispra
ku	Kuopio	la	L'Aquila	lc	Lecce
le	Leipzig	ll	Lille	lm	Limassol
ma	Madrid	mi	Minsk	ms	Maisach
na	Naples	oh	Obs. Hohenpeissenberg	pl	Palaiseau
po	Potenza	py	Payerne	sf	Sofia
sp	Sankt Petersburg	th	Thessaloniki	wa	Warsaw
EARLINET non-permanent stations					
du	Dushanbe	me	Melpitz	ni	Nicolosi and Catania
EARLINET joining stations*					
bg	Belgrade	bj	Burjassot	cj	Cluj-Napoca
fi	Finokalia	ro	Rome Tor Vergata		
Cloudnet stations					
ca	Cabauw	ch	Chilbolton	hy	Hyytiälä
ju	Jülich	le/lm	Leipzig/Limassol**	ln	Lindenberg
mh	Mace Head	ny	Ny Ålesund	pl	Palaiseau
po	Potenza	so/ke	Sodankylä/Kenttärova**		

* Stations which have applied for EARLINET but which are not yet fully integrated

** Same Cloudnet equipment applied at different locations

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Section 1

EARLINET Station Reports

Period: April 2017 – March 2018

Summary

- **Regular observations:** Regular measurements following the EARLINET schedule have been performed at 23 out of 28 permanent stations. However, several stations could not operate continuously during the reporting period, mainly because of technical problems (7 stations reported longer off-times due to laser failures), ongoing upgrades or operation of the systems in field experiments. One station is under reconstruction. One station was not and two stations not permanently operated because of lack of personnel.
- **QA tests:** Most of the stations performed the QA tests (22 out of 28 permanent stations and four joining stations).
- **Data submission:** 20 out of 28 permanent stations performing regular measurements submitted the data to the database on a regular basis. The other stations still work on data quality or testing of SCC procedures.
- **Use of Single Calculus Chain (SCC):** The SCC is increasingly used in the network. About half of the stations reported regular use of the SCC. A training workshop to improve use of the SCC is planned for end of 2018.
- **Handbook of Instruments (HoI):** The HoI is up-to-date for 23 out of 28 permanent stations as well as for four joining stations. Recent updates are reported as major reason for missing data in the HoI.
- **Upgrades:** Upgrades and modifications to systems were reported by 7 permanent stations. The upgrades comprise new lasers, new measurement channels and other improvements. One station is under reconstruction and one system underwent a major upgrade.

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Station **Andoya (an)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Regular measurements until Nov 1st. 2017. Infrastructure (emergency back-up power system at ALOMAR) and laser problems after this. Laser back in function March 22nd.

Internal quality checks have been performed

(•) Yes ( ) No

Comment:

Quality assurance tests performed autumn 2017.

Data have been regularly submitted to the database

(•) Yes ( ) No

Comment:

All measurements with appropriate quality have been uploaded.

Data have been evaluated with the Single Calculus Chain

(•) Yes ( ) No

Comment:

All data uploaded to database have been processed using SCC.

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on:

Comment:

No changes made since update in 2016.

Upgrades and status changes during the reporting period, other comments

Laser problem discovered in January 2018 (first possible measurement day after Nov 1st. 2017). Actions to correct this have been taken and the laser is operational since March 22nd. 2018.

Station **Athens (at)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Internal quality checks have been performed

(•) Yes ( ) No

Comment:

Data have been regularly submitted to the database

( ) Yes (•) No

Comment:

Data have been submitted up to the end of 2016. The 2017 data have been partially submitted. Further data processing is on going.

Data have been evaluated with the Single Calculus Chain

(•) Yes ( ) No

Comment:

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on: 2018/03/16

Comment:

Upgrades and status changes during the reporting period, other comments

Station **Barcelona (ba)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(●) Yes ( ) No

Comment:

Yes until June 2017, then the laser broke. Measurements were resumed in October/November until the laser broke again. The laser is being re-installed in March 2018.

Internal quality checks have been performed

(●) Yes ( ) No

Comment:

Internal QC were performed in November 2017 but not sent to Volker, because we were not happy with the results, and then the laser broke. We will perform QC as soon as the laser is installed again.

Data have been regularly submitted to the database

(●) Yes ( ) No

Comment:

Data have been uploaded to the database in July 2017 and February 2018.

Data have been evaluated with the Single Calculus Chain

(●) Yes ( ) No

Comment:

Handbook of Instruments is up-to-date

(●) Yes ( ) No Checked on: 2016/12/15

Comment:

No change since that date.

Upgrades and status changes during the reporting period, other comments

Station **Belsk (be)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Internal quality checks have been performed

(•) Yes ( ) No

Comment:

Data have been regularly submitted to the database

(•) Yes ( ) No

Comment:

however, winter data are under evaluation

Data have been evaluated with the Single Calculus Chain

(•) Yes ( ) No

Comment:

We do expect synchronization of SCC and EARLINET database, we also hope for a tool for more automatic upload of data to SCC.

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on:

Comment:

Upgrades and status changes during the reporting period, other comments

Station **Bucharest (bu)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Internal quality checks have been performed

(•) Yes ( ) No

Comment:

Data have been regularly submitted to the database

(•) Yes ( ) No

Comment:

Part of the 2017 data has been submitted to the database but the submission is not finalized. We are trying to use the SCC to process all data submitted to the database. This is the cause of the delay.

Data have been evaluated with the Single Calculus Chain

(•) Yes ( ) No

Comment:

We are using the SCC to process all lidar data. We are working on optimizing and automatizing the data submission and the cloud screening procedures before the submission.

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on: 2017/12/01

Comment:

Upgrades and status changes during the reporting period, other comments

The instrument is working properly. No significant upgrades were performed to the instrument. In the near future we are planning to upgrade the emission unit of the instrument.

Station **Cabauw (ca)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

◯ Yes ◯ No

Comment:

if no, please explain

Internal quality checks have been performed

◯ Yes ◯ No

Comment:

if no, please explain

Data have been regularly submitted to the database

◯ Yes ◯ No

Comment:

if no, please explain

Data have been evaluated with the Single Calculus Chain

◯ Yes ◯ No

Comment:

if no, please explain

Handbook of Instruments is up-to-date

◯ Yes ◯ No Checked on:

Comment:

if no, please explain

Upgrades and status changes during the reporting period, other comments

Station **Clermont-Ferrand (cl)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Internal quality checks have been performed

(•) Yes ( ) No

Comment:

Data have been regularly submitted to the database

(•) Yes ( ) No

Comment:

Data have been evaluated with the Single Calculus Chain

(•) Yes ( ) No

Comment:

It is just the beginning of a regular use of the SCC. At the present time we are not ready to submit data to the SCC in NRT.

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on: 2018/03/02

Comment:

It is up-to-date on the SCC website (and database), but it is not on the Earlinet website.

Upgrades and status changes during the reporting period, other comments

No change on the present system which keeps on performing measurements, but with no support anymore : all the funds received and all the development implemented are focused on a parallel project for our future multi wavelength lidar system.

Station **Cork (co)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Regular measurements were performed from 1st April 2017 to 23rd October 2017 where subsequent pc and laser failure occurred.

Internal quality checks have been performed

( ) Yes (•) No

Comment:

This was delayed until the problem with our depolarization channels was solved. The problem could not be solved as pc and laser failure occurred.

Data have been regularly submitted to the database

( ) Yes (•) No

Comment:

All data from this period will be submitted within April 2018.

Data have been evaluated with the Single Calculus Chain

(•) Yes ( ) No

Comment:

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on: 2018/04/04

Comment:

Upgrades and status changes during the reporting period, other comments

Pc failure: 1st November 2017
Laser failure: 15th December 2017

Station **Evora (ev)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Internal quality checks have been performed

(•) Yes ( ) No

Comment:

Data have been regularly submitted to the database

( ) Yes (•) No

Comment:

Only 173 dataset were submitted to the EARLINET database mainly focused on the desert dust intrusion occurred at the station and on the long range transport from the canadian forest fires. The main reason is the difficulties in the automation of the data preparation to be submitted to the SCC.

Data have been evaluated with the Single Calculus Chain

(•) Yes ( ) No

Comment:

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on:

Comment:

Upgrades and status changes during the reporting period, other comments

The station worked almost 24h/7d for the whole period covered by this report. Flash lamps and water cooling were replaced regularly (3 times during the year) as the filter cartridge in the power supply. As mentioned in a previous point on the data submission, we are working on the tool for the automatic preparation of the input data file for the SCC.

Station **Garmisch-Partenkirchen (gp)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

○ Yes ◉ No

Comment:

Due to ongoing laser issues measurements were not resumed before September 2017.

Internal quality checks have been performed

◉ Yes ○ No

Comment:

Data have been regularly submitted to the database

◉ Yes ○ No

Comment:

Data have been evaluated with the Single Calculus Chain

○ Yes ◉ No

Comment:

The SCC does not allow for calculating ozone which is a part of the aerosol retrieval; this is not expected to change because of the considerable complexity of the algorithms. The same holds for the HSRL.

Handbook of Instruments is up-to-date

○ Yes ◉ No Checked on:

Comment:

According to Volker Freudenthaler the HoI is closed; thus, my offer to add information on the 313-nm channel could not be put into practice.

Upgrades and status changes during the reporting period, other comments

Better daylight filtering required at 313 nm (see 2016 presentation on PMTs).

Station **Granada (gr)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

EARLINET scheduled measurements with MULHACEN (LR331-D400) have been performed and additionally an intensive measurement period has been developed during SLOPE II campaign. The measurement with VELETA was initiated in May 2017 but stopped due to technical failure since July 2017 (its laser will be reinstalled during April 2018).

Internal quality checks have been performed

(•) Yes ( ) No

Comment:

MULHACEN (LR331-D400) quality checks performed in August 2017. This system was upgraded for implementing the rotational Raman channels. VELETA (LR111-ESS-D200) quality checks will be performed after installation of the new laser head.

Data have been regularly submitted to the database

( ) Yes (•) No

Comment:

We are submitting data in batches including several months.

Data have been evaluated with the Single Calculus Chain

(•) Yes ( ) No

Comment:

Data have been evaluated with SCC for period September-December 2017. Data in other periods were processed with in-house software.

Handbook of Instruments is up-to-date

( ) Yes (•) No Checked on:

Comment:

The handbook for MULHACEN needs to be updated in order to include the new Rotational channels (still under evaluation).

Upgrades and status changes during the reporting period, other comments

Optical separation unit of MULHACEN has been upgrade to replace 387 nm by 353.9 nm and 607 nm by 531 nm. Still under technical checks.
VELETA laser source has been recently repaired and it will be installed in April 2018.

Station **Ispra (is)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Internal quality checks have been performed

(•) Yes ( ) No

Comment:

Data have been regularly submitted to the database

( ) Yes (•) No

Comment:

SCC outputs for 2016 submitted in 2017. Backlogs will be made up by the end of 2018.

Data have been evaluated with the Single Calculus Chain

(•) Yes ( ) No

Comment:

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on: 2018/04/18

Comment:

Upgrades and status changes during the reporting period, other comments

New emission window on 23 May 2017.

Station **Kuopio (ku)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

○ Yes ◉ No

Comment:

The system has been in maintenance and upgrade during January - June 2017. After this, the system has been waiting to start a one-year campaign in United Arab Emirates, finally started on 8.3.2018. Campaign measurements have been continuous since then. The system will be back in Kuopio in March 2019.

Internal quality checks have been performed

◉ Yes ○ No

Comment:

For the new campaign start, yes. Will be coupled later on.

Data have been regularly submitted to the database

○ Yes ◉ No

Comment:

No measurements during the period.

Data have been evaluated with the Single Calculus Chain

○ Yes ◉ No

Comment:

Single cases have been tested for the old system but no comprehensive performance has been done. We are ready, if asked, to submit data to SCC for the old system only at the moment. The new system/channels have to be implemented in SCC.

Handbook of Instruments is up-to-date

○ Yes ◉ No Checked on:

Comment:

The HOI is valid for the system prior the upgrade. For the new system, the HOI update is in process.

Upgrades and status changes during the reporting period, other comments

One-year campaign in United Arab Emirates, March 2018 - February 2019.

Station **L'Aquila (la)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

○ Yes ◉ No

Comment:

We are in transition to a standard 3+2 wavelengths Raman Lidar, recently we have restarted the measurements in UV, and after completing the perfomances checks we will be back to full operations.

Internal quality checks have been performed

○ Yes ◉ No

Comment:

We plan to perform the internal quality checks as soon as our new system will be in its final configuration.

Data have been regularly submitted to the database

○ Yes ◉ No

Comment:

Maybe, the recent measurements in the UV will be submitted after evaluating their quality.

Data have been evaluated with the Single Calculus Chain

○ Yes ◉ No

Comment:

No data to be evaluated in the period 01/04/2017 - 31/03/2018

Handbook of Instruments is up-to-date

○ Yes ◉ No Checked on:

Comment:

We will release as soon as possible a new HOI.

Upgrades and status changes during the reporting period, other comments

We are aware that LA is not attending the EARLINET scheduled measurements since a long period.
We are now ready to set up the final configuration of a 3+2 wavelength Raman lidar system; we have recently restarted the aerosol backscatter and extinction measurements in UV.
Although our infrastructures are still suffering the consequences of recents earthquakes, our new lidar will be located in a save lab, close to other instrumentation like sunphotometer, x-band radar, UV pyranometers, balloon launching facility.

Station **Lecce (lc)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Internal quality checks have been performed

(•) Yes ( ) No

Comment:

Data have been regularly submitted to the database

( ) Yes (•) No

Comment:

It will be done whithin next month, because of the lack of personnel.

Data have been evaluated with the Single Calculus Chain

( ) Yes (•) No

Comment:

because of the lack of personnel

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on:

Comment:

Upgrades and status changes during the reporting period, other comments

Station **Leipzig (le)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Due to intense campaign activity, not always a lidar was available at Leipzig, but most of the time could be covered.

Internal quality checks have been performed

(•) Yes ( ) No

Comment:

2 systems used: PollyXT_OCEANET and Polly1v2.

Data have been regularly submitted to the database

(•) Yes ( ) No

Comment:

Data have been evaluated with the Single Calculus Chain

( ) Yes (•) No

Comment:

Only for testing purposes in the development data base. Results for optical properties not yet sufficient for routine use of SCC.

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on: 2018/04/03

Comment:

Upgrades and status changes during the reporting period, other comments

Station **Lille (II)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(●) Yes ( ) No

Comment:

We made regular measurements when the weather was favorable and when our Low Power LiDAR (which works 24h/7d) was showing the presence of a layer. 68 days of measurements.

Internal quality checks have been performed

(●) Yes ( ) No

Comment:

Polarization calibration, Rayleigh check and telecover test were performed.

Data have been regularly submitted to the database

( ) Yes (●) No

Comment:

We sent 2 nights (14/06/2017 and 28/08/08).
Submission remains heavy job that must be automatized.

Data have been evaluated with the Single Calculus Chain

(●) Yes ( ) No

Comment:

We are waiting to transfer the data processed by SCC to EARLINET database in an automatic way.

Handbook of Instruments is up-to-date

(●) Yes ( ) No Checked on: 2018/03/23

Comment:

No change since March 2017.

Upgrades and status changes during the reporting period, other comments

Laser was in failure between December 15, 2017 and beginning of March 2018.

Station **Limassol (lm)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

○ Yes ◉ No

Comment:

Measurements have been regularly performed up to 30 September 2017.
After October 2017, due to the lack of staff and the operation of the PollyXT lidar in Limassol (CyCARE), no measurements performed with the CUT depolarization lidar system. Lidar measurements are available for the whole reporting period.

Internal quality checks have been performed

◉ Yes ○ No

Comment:

CUT system participated to the TNA intercomparison campaign with the prototype LMU system in March-April 2017. CyPRIOT took place at Limassol, Cyprus.

Data have been regularly submitted to the database

○ Yes ◉ No

Comment:

Due to limited staff, only selected cases have been analysed and uploaded to the database.

Data have been evaluated with the Single Calculus Chain

○ Yes ◉ No

Comment:

So far only in-house software is used for the analysis of the data. SCC netcdf files are available for evaluation with SCC.

Handbook of Instruments is up-to-date

◉ Yes ○ No Checked on:

Comment:

No changes have been made that influence the HoI.

Upgrades and status changes during the reporting period, other comments

No changes have been made during the reporting period.

Station **Madrid (ma)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Internal quality checks have been performed

(•) Yes ( ) No

Comment:

Data have been regularly submitted to the database

(•) Yes ( ) No

Comment:

Data have been evaluated with the Single Calculus Chain

(•) Yes ( ) No

Comment:

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on:

Comment:

Upgrades and status changes during the reporting period, other comments

Station **Minsk (mi)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Regular measurements with MSTL-2 lidar system are carried out in Minsk.
MLR-Mobile system are used for field experimentsw, including seasonal measurements in Antarctic.

Internal quality checks have been performed

(•) Yes ( ) No

Comment:

Data have been regularly submitted to the database

(•) Yes ( ) No

Comment:

Data processing for the reporting period was carried out in the last quarter due to the problems of the working staff.

Data have been evaluated with the Single Calculus Chain

( ) Yes (•) No

Comment:

Regular measurements are processed with in-house software.

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on:

Comment:

Upgrades and status changes during the reporting period, other comments

We are manufacturing lidar equipment modules to transform the MLR-mobile lidar into an automated lidar with two receiving systems located in a container, to provide lidar observations at the Belarussian Antarctic station. We plan to complete this work in 1 q, 2019.

Station **Maisach (ms)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

○ Yes ◉ No

Comment:

Lack of personnel

Internal quality checks have been performed

○ Yes ◉ No

Comment:

no measurement

Data have been regularly submitted to the database

○ Yes ◉ No

Comment:

no measurements

Data have been evaluated with the Single Calculus Chain

○ Yes ◉ No

Comment:

no measurements

Handbook of Instruments is up-to-date

◉ Yes ○ No Checked on: 2018/04/03

Comment:

Upgrades and status changes during the reporting period, other comments

Station **Naples (na)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Starting from March 2017 the laser system required extraordinary maintenance. On July 2017 the laser has been replaced with the new Quantell Q-Smart 450. Since July 2017 the measurements were regularly performed in Naples with MALIA lidar system following EARLINET measurement schedule.

Internal quality checks have been performed

( ) Yes (•) No

Comment:

We didn't perform Telecover and Rayleigh fit test in the period April 2017-March 2018 and we plan to do it in the coming months.

Data have been regularly submitted to the database

(•) Yes ( ) No

Comment:

Data have been evaluated with the Single Calculus Chain

( ) Yes (•) No

Comment:

Until today regular measuremens were processed using our software. We plan to use SCC soon.

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on: 2016/03/18

Comment:

Upgrades and status changes during the reporting period, other comments

Replacement of the Brillant B Quantell laser source with the new Quantell Q-Smart 450.

Station **Obs. Hohenpeissenberg (oh)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Internal quality checks have been performed

( ) Yes (•) No

Comment:

Depolarization calibration is performed daily. There are some telecover tests, but not enough. We need to implement the tests in the operational measurement strategy and automatize analysis tools.

Data have been regularly submitted to the database

( ) Yes (•) No

Comment:

We needed to develop a visual quality test tool for the SCC output profiles. When this was finished, we started the upload of data to the db. This problem is solved.

Data have been evaluated with the Single Calculus Chain

(•) Yes ( ) No

Comment:

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on:

Comment:

The HoI at the SCC server is up-to-date.

Upgrades and status changes during the reporting period, other comments

* Implemented a device for telecover tests which can be handled via remote control (but manually)
 -> no need to be on site for night-time telecover tests
 -> no disturbance of thermal conditions inside instrument because doors remain closed.
* Additional ND filters are automatically placed in front of Raman channels if background light is high.

Station **Palaiseau (pl)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(●) Yes ( ) No

Comment:

101 days of measurements have been performed for the period including 38 complete nights.
in 2017: 6 in march, 8 in april and may, 15 in june, 8 in july, 17 in august, 9 in september, 15 in october, 5 in november, and 3 in december.
in 2018: 8 in february and 5 in march.

Internal quality checks have been performed

(●) Yes ( ) No

Comment:

Lidar Remote Quality Assurance (LiReQA), EQA1-SIRTA-2017, 23 oct 2017
Lical TNA Access LCU-SIRTA-2017 December 14 for 5 days. Evaluation
for depolarization calibration and improvment of near range telescope alignement.

Data have been regularly submitted to the database

( ) Yes (●) No

Comment:

Effort have been made in developping INDRA algorithm suitable for IPRAL system with telecover, Quality analysis and profile retrievals. Training have been performed to use and apply INDRA algorithm by SIRTA team members.
Steps towards submission are: *continued at bottom of page

Data have been evaluated with the Single Calculus Chain

(●) Yes ( ) No

Comment:

SCC algorithm have been applied to SCC for elastic retrievals in 355, 532 and 1064nm. Raman retrievals have been successfully tested for near range and far range telescope (usecase 4 and usecas 9) separately. Merging near and far range telescope are cirrently being tested. Retrievals are also currently evaluated and compared to INDRA retrievals before submission to EARLINET DB.

Handbook of Instruments is up-to-date

(●) Yes ( ) No Checked on: March 2018

Comment:

No changes have been made on the system that requires HOI update.

Upgrades and status changes during the reporting period, other comments

No upgrades and no status changes but evaluation of the near range telescope alignment during Lical LCU-SIRTA2017 shows that improvment of design of thte near range telescope/WSU needs to be investigated to improve alignment control and slight settings.
Implementation of camera at the output of 532 channel was investigated and is planned to be implemented in 2018.

*continuation from above:
Automatic sorting of raw data in dedicated data storage space for IPRAL: done
Generation of Netcdf range corrected backscatter daily files: done
Development and adaptation of a local tool (INDRA) to perform QA and retrievals: done, error calculations in progress
Klett-based retrievals of backscatter profiles with SCC: in progress
Raman based retrievals of backscatter and extinction profiles with SCC: in progress

Station **Potenza (po)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Internal quality checks have been performed

(•) Yes ( ) No

Comment:

Data have been regularly submitted to the database

(•) Yes ( ) No

Comment:

Data until 19 October 2017 have been regularly submitted.

Data have been evaluated with the Single Calculus Chain

(•) Yes ( ) No

Comment:

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on: 2018/03/31

Comment:

Upgrades and status changes during the reporting period, other comments

No upgrades and status changes for MUSA during the reporting period.

Station **Payerne (py)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Internal quality checks have been performed

( ) Yes (•) No

Comment:

RALMO underwent the replacement of the laser source. The measurements have been disrupted almost always during November 2017-January 2018.

Data have been regularly submitted to the database

(•) Yes ( ) No

Comment:

During the period from November 2017-January 2018 only few data have been submitted to the server.

Data have been evaluated with the Single Calculus Chain

( ) Yes (•) No

Comment:

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on:

Comment:

Upgrades and status changes during the reporting period, other comments

- Replacement of air conditioner in the Raman lidar cabin in November 2017. The new air conditioner is mounted on the north wall (former AC was on east wall) with subsequent change of air flow in the cabin.

- Replacement of the 355-nm Continuum laser source with the new 355-nm by Litron Lasers Ltd. The new laser provides 450 mJ @ 30 Hz. The replacement of flashlamp does not require a subsequent alignment; the laser energy is continuously tracked and kept to its maximum.

Station **Sofia (sf)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(●) Yes ( ) No

Comment:

Measurements have been performed all the time except when the lidar system was necessary to be repaired or the weather conditions were unappropriate.

Internal quality checks have been performed

( ) Yes (●) No

Comment:

Rayleigh fit test is made on all the measured and analyzed lidar data because of the implementation of such test in our data-processing system. Telecover test have not been performed regularly. We used an other criteria to achieve fine tuning of the lidar, observing the form of the attenuated lidar signal.

Data have been regularly submitted to the database

(●) Yes ( ) No

Comment:

Data of all measurements we performed was submitted to the database.

Data have been evaluated with the Single Calculus Chain

( ) Yes (●) No

Comment:

We have developed our own system for lidar data processing and actually we are not ready to work with the SCC.

Handbook of Instruments is up-to-date

(●) Yes ( ) No Checked on: 2018/03/20

Comment:

The repetition rate of the lidar with Cu-Br-vapor laser is not strongly fixed because of different laser's tubes we use. It can be fixed at 7kHz, 10kHz or 13kHz.

Upgrades and status changes during the reporting period, other comments

Station **St. Petersburg (sp)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Internal quality checks have been performed

( ) Yes (•) No

Comment:

There are some problems with telecover test.

Data have been regularly submitted to the database

( ) Yes (•) No

Comment:

There were minor problems with data processing. Data of 2017 year were sent on server and now is available on web site.

Data have been evaluated with the Single Calculus Chain

( ) Yes (•) No

Comment:

Completion of internal quality checks and handbook filling are awaiting.

Handbook of Instruments is up-to-date

( ) Yes (•) No Checked on:

Comment:

Collecting needable parameters is in process.

Upgrades and status changes during the reporting period, other comments

Station **Thessaloniki (th)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

○ Yes ◉ No

Comment:

There are no measurements for the period 1/6/2017 to 30/11/2017 due to major upgrade of the lidar telescope. There are few measurements available for the rest of the period.

Internal quality checks have been performed

◉ Yes ○ No

Comment:

We are performing a series of internal quality checks in order to optimize the operation after the telescope upgrade. We will submit these as soon as we have decided the optimum setup.

Data have been regularly submitted to the database

◉ Yes ○ No

Comment:

The few available measurements for the period have been processed and will submitted to the database within April 2018.

Data have been evaluated with the Single Calculus Chain

○ Yes ◉ No

Comment:

Evaluation with the SCC is ongoing.

Handbook of Instruments is up-to-date

○ Yes ◉ No Checked on:

Comment:

The HoI will be updated as soon as the measurements with the new telescope will be optimized.

Upgrades and status changes during the reporting period, other comments

The lidar telescope has been redesigned and adjustments in the receiver optics have been applied.

Station **Warsaw (wa)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Lidar is operated in continuous mode. There is no data available in February to April due to the laser head failure.

Internal quality checks have been performed

(•) Yes ( ) No

Comment:

The depolarization calibration, telecover test and Rayleigh fit are performed regularly.

Data have been regularly submitted to the database

(•) Yes ( ) No

Comment:

Lidar data are evaluated manually and submitted to Data Base. Focus was to increase evaluation for 2013-2015 data (>1500 finalized files). All climatology files for 2016 are in data base. The decision has been made that all data of 2017 will be evaluated only with SCC.

Data have been evaluated with the Single Calculus Chain

( ) Yes (•) No

Comment:

There is no success in using SCC. There is a new version of SCC-converter provided by I. Mattis (DWD) which is installed. The lidar configuration is set up in the SCC interface. First-guess evaluation paramaters are set up but not optimized.

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on: 2018/04/05

Comment:

Upgrades and status changes during the reporting period, other comments

Since December 2016, there is AERONET photometer (Warsaw_UW site) provided by D. Nicolae (INOE) co-located with the lidar.

Station **Dushanbe (du)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

○ Yes ◉ No

Comment:

The PollyXT lidar did only measure at Dushanbe during the CADEX campaign. TROPOS got the funding for a permanent lidar system at Dushanbe and will install this system in 2019/2020.

Internal quality checks have been performed

○ Yes ◉ No

Comment:

see above

Data have been regularly submitted to the database

○ Yes ◉ No

Comment:

see above

Data have been evaluated with the Single Calculus Chain

○ Yes ◉ No

Comment:

see above

Handbook of Instruments is up-to-date

○ Yes ◉ No Checked on:

Comment:

see above

Upgrades and status changes during the reporting period, other comments

Station **Serra La Nave / Nicolosi (ni)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

○ Yes ◉ No

Comment:

Measurements were performed in Serra La Nave (ETNA) with mobile lidar system AMPLE during some ETNA eruptions. On July 2017 the system required extraordinary maintenance of the software module.

Internal quality checks have been performed

○ Yes ◉ No

Comment:

We didn't perform Telecover and Rayleigh fit test in the period April 2017-March 2018 and we plan to do it in the coming months.

Data have been regularly submitted to the database

○ Yes ◉ No

Comment:

Some data will be processed but not still uploaded in the database. This will be performed as soon as possible.

Data have been evaluated with the Single Calculus Chain

○ Yes ◉ No

Comment:

Regular mesurements were processed using DALA software developed specifically for our system.

Handbook of Instruments is up-to-date

○ Yes ◉ No Checked on:

Comment:

Not yet but as soon as possible.

Upgrades and status changes during the reporting period, other comments

Upgrade of the system with 532 nm (P and S) and 607 nm channels.

Station **Belgrade (bg)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

○ Yes ◉ No

Comment:

Measurements have been regularly performed since February 2018. For the previous period some measurements for internal database have been performed for specific case studies.

Internal quality checks have been performed

◉ Yes ○ No

Comment:

Data have been regularly submitted to the database

○ Yes ◉ No

Comment:

Regular measurements have started recently.

Data have been evaluated with the Single Calculus Chain

○ Yes ◉ No

Comment:

Data have been processed with Raymetrics software and evaluated using the SCC. Internal software has not been completed and evaluated.

Handbook of Instruments is up-to-date

◉ Yes ○ No Checked on: 2017/10/17

Comment:

Upgrades and status changes during the reporting period, other comments

Station **Burjassot (bj)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

○ Yes ◉ No

Comment:

The laser is still out of order and no measurements were performed during the reporting period. We have been working a lot trying to find a solution. Finally, we are waiting for a new laser.

Internal quality checks have been performed

○ Yes ◉ No

Comment:

Data have been regularly submitted to the database

○ Yes ◉ No

Comment:

Data have been evaluated with the Single Calculus Chain

○ Yes ◉ No

Comment:

Handbook of Instruments is up-to-date

○ Yes ◉ No Checked on:

Comment:

Most of the elements of the RMAN-510 are determined. However, we still lack information about some components of the receiving optics. We are already working in this issue.

Upgrades and status changes during the reporting period, other comments

Station **Cluj-Napoca (cl)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

○ Yes ◉ No

Comment:

Problem with laser emission at 355 nm.

Internal quality checks have been performed

◉ Yes ○ No

Comment:

Performed all checks except the ones associated with the 355 nm channel.

Data have been regularly submitted to the database

○ Yes ◉ No

Comment:

Data have been evaluated with the Single Calculus Chain

○ Yes ◉ No

Comment:

Handbook of Instruments is up-to-date

◉ Yes ○ No Checked on: 2017/11/20

Comment:

Upgrades and status changes during the reporting period, other comments

Laser submited to Continuum for 355 nm emission problem + alignment.
Deionizer unit changed.
Flash lamp changed.

We are currently (April 2018) replacing the neutral filters to adjust to new emission parameters.
HOI update to follow.

Station **Finokalia (fi)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(•) Yes ( ) No

Comment:

Internal quality checks have been performed

(•) Yes ( ) No

Comment:

Telecover tests have been performed. Rayleigh fits are available. Depolarization calibration is performed regularly 3 times a day.

Data have been regularly submitted to the database

( ) Yes (•) No

Comment:

We want to submit data through the SCC platform but until today we are not able to use the platform to produce the level 2 profiles. After contacting the developers this issue appears to be an SCC bug. We are expecting their feedback on the matter.

Data have been evaluated with the Single Calculus Chain

( ) Yes (•) No

Comment:

The same reason explained above

Handbook of Instruments is up-to-date

(•) Yes ( ) No Checked on: 2017/04/27

Comment:

Upgrades and status changes during the reporting period, other comments

Station **Rome (ro)** Period: 01/04/2017 - 31/03/2018

Measurements have been regularly performed

(●) Yes ( ) No

Comment:

Measurements were not performed between 26/10/2017 and 20/01/2018 due to laser maintenance (replacement of laser oscillator and optics inside the cavity).

Internal quality checks have been performed

(●) Yes ( ) No

Comment:

Rayleigh fit, telecover test and dark measurements were performed.

Data have been regularly submitted to the database

( ) Yes (●) No

Comment:

The in-house version of the Klett algorithm has been successfully compared to the EARLINET tests. The evaluation of Raman algorithm highlighted that some corrections on the algorithm have to be done before the data submission.

Data have been evaluated with the Single Calculus Chain

( ) Yes (●) No

Comment:

First data were uploaded to SCC with different errors. A mission of few days is planned to Potenza to fix these errors.

Handbook of Instruments is up-to-date

(●) Yes ( ) No Checked on: 2018/03/23

Comment:

Upgrades and status changes during the reporting period, other comments

The addition of a polarized channel at 532 nm is on going. The objective is having first polarization measurements before the end of 2018.

Section 2

Cloudnet Station Reports

Period: April 2017 – March 2018

Summary

- **Stations:** There have been significant gaps in continuous operation at a number of sites due to instrument requiring repair. Two sites have also not been in operation as their systems had been deployed in field experiments, with one site also being moved to a new location. There are new stations in construction/testing, and datasets from several long-term field experiments in review.
- **Calibration:** No standardised or regular calibration is performed for every instrument at every site.
    - Cloud radar - no absolute calibration except for Palaiseau (fixed target) and Chilbolton (intercomparison with calibrated S-band radar). Most sites monitor transmit pulse and noise.
    - Ceilometer - calibration performed. Some sites use intercomparison with Raman instruments. Cloud calibration technique at regular intervals implemented at some sites.
    - MWR - Almost all sites use standardised MWRNET/TOPROF procedures, with tip curves and liquid nitrogen. These procedures will be implemented at regular intervals and applicability of clear-sky LWP cross-check (Gaussiat et al., 2004) at all sites is being investigated.
- **Model data:** ECMWF model data are standard for most sites, but provision for 'local' model data is present (e.g., RACMO at Cabauw, COSMO-EU at Lindenberg). Since model/radiosonde data are necessary for Cloudnet operation, but not always available, GDAS data is now available for every site. ICON-IGLO is available for many sites, HARMONIE (available from 3 Met Services) is being tested for sites within the respective domains, and WRF is also being tested at Leipzig and Limassol.
- **Processing up to date, NRT and transfer:** NRT operation requires reliable NRT transfer of model or radiosonde data, which is now present. All sites have NRT capability (data for Mace Head, Palaiseau and Finnish sites processed at Cloudnet server), and most sites now run Cloudnet processing in NRT.
- **Manual QC inspection:** Data at each site has been inspected for data quality issues, but this is not yet routine at all sites.
- **Suitability for publication:** Data at each site are suitable for specific publications (e.g. those written by members of the station), but not yet for wider dissemination (used by those not familiar with the specific dataset).

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Station **Cabauw (ca)** Period: 01/04/2017 - 31/03/2018

Instrumentation	Date and method of last calibration
☑ Cloud Radar	No absolute calibration, daily reading power and system noise figure
☑ Ceilometer/Lidar	LD40 method O'Conner, CHM15K by E-Profile project
☑ Microwave Radiometer	LN calibration with new RPG cal. box: 07-NOV-2017
☑ Rain Gauge/Disdrometer	unknown
☑ Doppler Lidar	unknown
☑ Other	Raman lidar Caeli, TARA and IDRA radar, windprofiler, 200 m tower with T,q,visibility and winds, GHG, surface and soil instrumentation (calibration method and dates: not applicable, unknown or according to instructions)

Model data/radiosonde data available

◉ Yes ○ No

Comment:

Radiosonde one daily at De Bilt at 0 UTC, daily RACMO model output

Cloudnet processing up to date

◉ Yes ○ No

Comment:

Probably, not sure about latest releases (where are updates announced?)

NRT operation

◉ Yes ○ No

Comment:

Cloudnet processing is run once daily with RACMO model input (offline processing with HARMONIE output and CHM15 implemented and tested)

Data transferred to server

○ Yes ◉ No

Comment:

Post processing and data quality control remains an issue to be solved before data will be transferred (some progress has been made over the past year, but due to limited resources

Processed data manually inspected

○ Yes ◉ No

Comment:

HATPRO manual editing of LWP data started but not completed yet. Manual inspection and editing of CloudNet products not implemented yet.

Data suitable for publication

○ Yes ◉ No

Comment:

Absolute calibration (bias) of cloudradar uncertain, HATPRO data need editing

Upgrades and status changes during the reporting period, other comments

HATPRO had continuous issues over the past year. End of 2017 operation was stopped due to frequent communication problems between HATPRO and host, and too frequent interrupts in data acquisition on HATPRO itself. Early 2018 HATPRO went down, probably due to failure of embedded PC. No repair or replacement planned due to lack of budget.

In January 2018 a Zephyr Doppler lidar was installed at Cabauw for period of 2 years.

Station **Chilbolton (ch)** Period: 01/04/2017 - 31/03/2018

Instrumentation	Date and method of last calibration
☑ Cloud Radar	12/12/2017. Intercomparison of Copernicus cloud radar with S-band CAMRa radar.
☑ Ceilometer/Lidar	Calibrated via stratocumulus. Last done 31/03/18
☑ Microwave Radiometer	Last tip curve applied 22/09/16
☑ Rain Gauge/Disdrometer	Drop counting and tipping bucket gauges June 2013. Monthly intercomparisons of all rain sensors.
☑ Doppler Lidar	Calibrated via stratocumulus. Last done 31/03/18
☐ Other	

Model data/radiosonde data available

◉ Yes ○ No

Comment:

Routine radiosonde at Larkhill, 30 km to west, some launches on site for campaigns, especially during January 2018.

Cloudnet processing up to date

○ Yes ◉ No

Comment:

NRT operation

○ Yes ◉ No

Comment:

Data transferred to server

◉ Yes ○ No

Comment:

Processed data manually inspected

○ Yes ◉ No

Comment:

Data suitable for publication

○ Yes ◉ No

Comment:

Upgrades and status changes during the reporting period, other comments

The Radiometrics microwave radiometer developed a fault on 04/02/2018. It was sent for repair. Hence no data available for this instrument from 04/02/2018-31/03/2018.

Station **Hyytiälä (hy)** Period: 01/04/2017 - 31/03/2018

Instrumentation	Date and method of last calibration
☑ Cloud Radar	MIRA 35S, internal calibration only
☑ Ceilometer/Lidar	Vaisala CL31 (no calibration)
☑ Microwave Radiometer	RPG 89 GHz embedded in RPG cloud radar (no calibration)
☐ Rain Gauge/Disdrometer	
☑ Doppler Lidar	Halo Photonics Streamline, cloud calibration: 17-19 July 2017
☑ Other	5 GHz weather radar (both campaigns) RPG 94 GHz Cloud radar (2nd campaign)

Model data/radiosonde data available

◉ Yes ○ No

Comment:

GDAS1 only, FMI-Harmonie and ECMWF will also become available

Cloudnet processing up to date

○ Yes ◉ No

Comment:

NRT operation

○ Yes ◉ No

Comment:

Data transferred to server

○ Yes ◉ No

Comment:

Processed data manually inspected

○ Yes ◉ No

Comment:

Data suitable for publication

○ Yes ◉ No

Comment:

Upgrades and status changes during the reporting period, other comments

Campaign Cloudnet station for dual-frequency precipitation measurements.
Campaign Cloudnet station for HyICE18 (ice nucleation campaign). Cloud radar recording at 1s resolution.
Halo ID 33 operating until 7 August 2017, then a data gap until
Halo ID 46 returned on 9 October 2017. Data gap from 15-23 March due to stuck scanner head.

Station **Jülich (ju)** Period: 01/04/2017 - 31/03/2018

Instrumentation	Date and method of last calibration
☑ Cloud Radar	05/10/2017 (update by Metek)
☑ Ceilometer/Lidar	
☑ Microwave Radiometer	12/06/2017 LN2 (new target of G5 HATPRO)
☐ Rain Gauge/Disdrometer	
☑ Doppler Lidar	04/04/2017 (update of TEC system by Halo Photonics)
☐ Other	

Model data/radiosonde data available
◉ Yes ○ No
Comment:
GDAS1, ICON-IGLO

Cloudnet processing up to date
◉ Yes ○ No
Comment:

NRT operation
◉ Yes ○ No
Comment:
delay of 2 days due to model data availability

Data transferred to server
◉ Yes ○ No
Comment:

Processed data manually inspected
◉ Yes ○ No
Comment:
weekly quicklook checks

Data suitable for publication
◉ Yes ○ No
Comment:

Upgrades and status changes during the reporting period, other comments

Cloud radar measurement gap: 05/01/2017-05/10/2017 (update by Metek)

Doppler lidar measurement gaps: 09/01/2017-04/04/2017 (update by Halo Photonics) and 08/07/2017-10/08/2017

Microwave radiometer measurement gap: 01/12/2016-19/05/2017 (update by RPG to G5 HATPRO)

Station **Kenttärova (ke)** Period: 01/04/2017 - 31/03/2018

Instrumentation	Date and method of last calibration
☑ Cloud Radar	MIRA 35S, internal calibration only
☑ Ceilometer/Lidar	Vaisala CT25K, cloud calibration: 17-19 July 2017
☑ Microwave Radiometer	RPG HATPRO, liquid N2 calibration on 06 November 2017
☐ Rain Gauge/Disdrometer	
☐ Doppler Lidar	
☐ Other	

Model data/radiosonde data available
◉ Yes ○ No
Comment:
GDAS1 only, FMI-Harmonie will also become available

Cloudnet processing up to date
○ Yes ◉ No
Comment:

NRT operation
○ Yes ◉ No
Comment:

Data transferred to server
○ Yes ◉ No
Comment:

Processed data manually inspected
○ Yes ◉ No
Comment:

Data suitable for publication
○ Yes ◉ No
Comment:

Upgrades and status changes during the reporting period, other comments

Campaign Cloudnet station for PACE 2017. Cloud radar operated from 22nd August to 19th December 2017 but there are many large gaps due to issues with weak wireless 3G connection. Data transfer was too slow for NRT operation, and also hampered instrument/data maintenance - data collection was at ~1s temporal resolution.
RPG microwave radiometer from Uni Köln joined from 06 November 2017.

Station **Leipzig (le)** Period: 01/04/2017 - 25/03/2018

Instrumentation	Date and method of last calibration
☐ Cloud Radar	
☐ Ceilometer/Lidar	
☐ Microwave Radiometer	
☐ Rain Gauge/Disdrometer	
☐ Doppler Lidar	
☐ Other	

Model data/radiosonde data available

◉ Yes ○ No

Comment:
gdas1 data

Cloudnet processing up to date

◉ Yes ○ No

Comment:
But no data recorded.....

NRT operation

○ Yes ◉ No

Comment:

Data transferred to server

○ Yes ◉ No

Comment:

Processed data manually inspected

○ Yes ◉ No

Comment:

Data suitable for publication

○ Yes ◉ No

Comment:

Upgrades and status changes during the reporting period, other comments

- No observations were performed during reporting period because the Leipzig Aerosol and Cloud Remote Observations System (LACROS) of TROPOS, Leipzig was located at the Cloudnet station Limassol during the whole time.

Station **Limassol (lm)** Period: 01/04/2017 - 31/03/2018

Instrumentation	Date and method of last calibration
☑ Cloud Radar	n/a
☑ Ceilometer/Lidar	25/03/2018: Baars et al., 2017, AMT,doi: 10.5194/amt-10-3175-2017
☑ Microwave Radiometer	11/09/2017
☑ Rain Gauge/Disdrometer	n/a
☑ Doppler Lidar	n/a, Vertical pointing angle constantly monitored
☐ Other	

Model data/radiosonde data available

◉ Yes ○ No

Comment:

gdas1 data

Cloudnet processing up to date

◉ Yes ○ No

Comment:

Until end of measurements Limassol on 25 March 2018.

NRT operation

◉ Yes ○ No

Comment:

Data transferred to server

◉ Yes ○ No

Comment:

Processed data manually inspected

◉ Yes ○ No

Comment:

Data suitable for publication

○ Yes ◉ No

Comment:

Retrieval problems occurred during period of broken cross-channel of Mira-35 cloud radar (see below)

Upgrades and status changes during the reporting period, other comments

- Observations were performed with the mobile Leipzig Aerosol and Cloud Remote Observations System (LACROS) of TROPOS, Leipzig
- cross channel of Mira-35 cloud radar was broken from 08/2017 to 12/11/2017.
- LACROS observations were stopped in Limassol on 25 March 2018. Afterwards, the instrument suite was transported back to Leipzig.

Station **Lindenberg (In)** Period: 01/04/2017 - 31/03/2018

Instrumentation	Date and method of last calibration
☑ Cloud Radar	
☑ Ceilometer/Lidar	
☑ Microwave Radiometer	MWP-3039A, LN2-calibrations: 21.11.16, 14.02.17, 16.03.17, 27.04.17, 23.05.17, 26.06.17, 20.07.17, 19.09.17, 21.09.17;TIP-calibrations: 01.12.16, 30.03.16, 04.05.17, 19.05.17, 24.05.17, 01.06.17, 22.06.17, 07.0717, 12.09.17
☑ Rain Gauge/Disdrometer	
☐ Doppler Lidar	
☐ Other	

Model data/radiosonde data available
◉ Yes ○ No
Comment:
COSMO/ICON-EU

Cloudnet processing up to date
◉ Yes ○ No
Comment:

NRT operation
◉ Yes ○ No
Comment:
once a day

Data transferred to server
◉ Yes ○ No
Comment:
once a day

Processed data manually inspected
◉ Yes ○ No
Comment:

Data suitable for publication
◉ Yes ○ No
Comment:
The comments below concerning LWP data quality and missing LWP data are to be considered.

Upgrades and status changes during the reporting period, other comments

Radiometer MP-3039A: problems with drift in calibration (instability) and with the rain sensor (sensitivity), therefore LWP data quality is restricted or unknown for the whole period, send to the manufacturer for repair, no LWP data since 11.09.2017!

No cloudnet products available for:
- 8./9.4.; 12.4. (failed cloud radar)
- 29., 30.6.; 1.-25.7. (maintenance/repair)
- 3., 4., 8., 9.,11., 28., 29.5.; 6., 13.6.; 10., 16., 23.8; 23., 25., 26., 29., 30.9.; 1., 2., 3., 25.10., 5., 22., 23.11.; 4.3. (failed cloudnet processing)

Station **Mace Head (mh)** Period: 01/04/2017 - 31/03/2018

Instrumentation	Date and method of last calibration
☑ Cloud Radar	none
☑ Ceilometer/Lidar	none
☑ Microwave Radiometer	liquid nitrogen calibration, 29/11/2016 [New Health and Safety regulations at NUIG prevented LN calibration since then. Hopefully this can be solved soon.]
☐ Rain Gauge/Disdrometer	
☑ Doppler Lidar	none
☐ Other	

Model data/radiosonde data available

◉ Yes ○ No

Comment:

No radiosondes available.

Cloudnet processing up to date

◉ Yes ○ No

Comment:

- time delay of 3 days
- since 25/01/2018, only first 11 hours of each day are processed

NRT operation

◉ Yes ○ No

Comment:

Data transferred to server

◉ Yes ○ No

Comment:

Unprocessed data is transferred in NRT.

Processed data manually inspected

○ Yes ◉ No

Comment:

Data suitable for publication

○ Yes ◉ No

Comment:

There is no data quality screening in place. There are gaps in the data set.

Upgrades and status changes during the reporting period, other comments

- power cuts on 23/04/2017 and during Christmas break at the end of 2017 caused some data gaps
- from 21/01 to 02/02/2018 water did not drain well from radar antenna
- from 04/12/2017 to 22/03/2018 two wind lidars (both WindCube 200S from Leosphere) were operated in parallel at Mace Head

Station **Ny-Ålesund (ny)** Period: 01/04/2017 - 31/03/2018

Instrumentation	Date and method of last calibration
☑ Cloud Radar	
☑ Ceilometer/Lidar	
☑ Microwave Radiometer	20/10/2017 LN2 calibration
☐ Rain Gauge/Disdrometer	
☐ Doppler Lidar	
☐ Other	

Model data/radiosonde data available
◉ Yes ○ No
Comment:
GDAS1, ICON-IGLO

Cloudnet processing up to date
◉ Yes ○ No
Comment:

NRT operation
◉ Yes ○ No
Comment:
delay of 2 days due to model data availability

Data transferred to server
◉ Yes ○ No
Comment:

Processed data manually inspected
◉ Yes ○ No
Comment:
monthly quicklook checks

Data suitable for publication
○ Yes ◉ No
Comment:
currently check of cloud radar data

Upgrades and status changes during the reporting period, other comments
Cloud radar: change of radar system on 27/07/2017; JOYRAD-94 (10/06/2017-26/07/2017), MiRAC (28/07/2017-ongoing)

Station **Palaiseau (pl)** Period: 01/04/2017 - 31/03/2018

Instrumentation	Date and method of last calibration
☑ Cloud Radar	BASTA DCR. Mast + metallic target and intercomparison in November 2017
☑ Ceilometer/Lidar	CHM15K ALC. No calibrated data but "Rayleigh calibration" done and processed by E-Profile.
☑ Microwave Radiometer	HATPRO MWR. LN2 in March 2018 (done every 6 months)
☑ Rain Gauge/Disdrometer	R3070a. Comparison with a reference volume, driven by Meteo-France
☑ Doppler Lidar	WLS70 DWL. Leosphere manufacturer maintenance in June 2017
☐ Other	

Model data/radiosonde data available

◉ Yes ○ No

Comment:

AROME and ARPEGE model are available on SIRTA site.
Two radiosoundes per day at Trappes site (20km from SIRTA) are available.

Cloudnet processing up to date

◉ Yes ○ No

Comment:

NRT operation

◉ Yes ○ No

Comment:

Yes for microwave radiometer data and for comparison with AROME model output.

Data transferred to server

◉ Yes ○ No

Comment:

Processed data manually inspected

○ Yes ◉ No

Comment:

Data suitable for publication

◉ Yes ○ No

Comment:

Upgrades and status changes during the reporting period, other comments

Station **Potenza (po)** Period: 01/04/2017 - 31/03/2018

Instrumentation	Date and method of last calibration
☑ Cloud Radar	Not calibrated
☑ Ceilometer/Lidar	CT25K: cloud calibration (15/01/2015); CHM15k calibration on MUSA EARLINET Reference lidar profiles (15/01/2015)
☑ Microwave Radiometer	TIP (21/04/2017); LN2 (21/04/2017)
☐ Rain Gauge/Disdrometer	
☐ Doppler Lidar	
☑ Other	VAISALA MILOS520 Automatic Weather Station for surface variables (pressure, temperature, humidity, wind, visibility and rain gauge); Novatel GPS antenna/receiver for integrated precipitable water vapour (IPWV)

Model data/radiosonde data available

◉ Yes ○ No

Comment:

gdas1
icon-iglo-12-23

Cloudnet processing up to date

◉ Yes ○ No

Comment:

NRT operation

◉ Yes ○ No

Comment:

Data transferred to server

◉ Yes ○ No

Comment:

Processed data manually inspected

◉ Yes ○ No

Comment:

Not routinely, only for periods used for specific studies or publications; consistency check with other instruments performed as well.

Data suitable for publication

◉ Yes ○ No

Comment:

Upgrades and status changes during the reporting period, other comments

Radar involved in the ACTRIS JRA1 PRETECT campaign 1-30 April 2017.
HALO wind lidar operation by end of 2018.

Station **Sodankylä (so)** Period: 01/04/2017 - 31/03/2018

Instrumentation	Date and method of last calibration
☐ Cloud Radar	
☑ Ceilometer/Lidar	Vaisala CT25K. Cloud calibration: 17-19 July 2017
☐ Microwave Radiometer	
☐ Rain Gauge/Disdrometer	
☑ Doppler Lidar	Halo Photonics Streamline Pro. Cloud calibration: 17-19 July 2017
☐ Other	

Model data/radiosonde data available

◉ Yes ○ No

Comment:

GDAS1 only, FMI-Harmonie will also become available

Cloudnet processing up to date

○ Yes ◉ No

Comment:

NRT operation

○ Yes ◉ No

Comment:

Data transferred to server

○ Yes ◉ No

Comment:

Processed data manually inspected

○ Yes ◉ No

Comment:

Data suitable for publication

○ Yes ◉ No

Comment:

Upgrades and status changes during the reporting period, other comments

The Cloudnet station operated by FMI as a permanent ACTRIS-Finland Cloud profiling station will move from Sodankylä to Kenttärova (Pallas). During this reporting period, the cloud radar was operating at a number of campaigns:
Hyytiälä from December 2016 to 28th July 2017
Kenttärova from 22nd August to 19th December 2017 for PACE 2017
Hyytiälä from 28th February 2018 as part of HyICE18 (ice nucleation campaign).
Doppler lidar operated from 17th July 2017 and failed on 21st November 2017 - no signal and random scanner head angles, similar to previous failure. Sent for repair - returned to action on 15th March 2018.

Section 3

EARLINET QA Tests

Period: April 2017 – March 2018

The following table for the reporting period 2017/18 shows a list of all the channels of all active lidar systems, which are supposed to deliver lidar signal products to the EARLINET data base and which have to be quality assured every year with the QA measurements RF (Rayleigh fit), TC (telecover), and Dark (dark measurement for analog channels). A detailed description of these tests is provided in Deliverable D2.5. The left column of the table indicates station ID (see Tab. 1) and system name in case of several instruments at the same station. Tests that were delivered to LiCal for external inspection are marked in green. Grey boxes indicate not necessary QA measurements for lidar systems which did not deliver data to the EARLINET data base within the reporting period. The right-most column contains not so common channels and 1064-nm dark measurements in case no other analog channels are present. The channel/signal names are composed of the wavelength (in nm) and a two to four character short-cut with the following meaning:

1st character
f__ = far-range telescope signal
n__ = near-range telescope signal
x__ = single-telescope signal
d__ = depolarization-telescope signal
2nd character
_t_ = total signal (no depolarization measurement)
_p_ = parallel signal
_c_ = cross signal
3rd character (optional)
__a = analogue signal
__p = photon counting signal
__g = analogue and photon counting glued signal (e.g. LICEL)
4th character (optional)
___l = rotational Raman lower wavelengths
___h = rotational Raman higher wavelengths
___r = rotational Raman high and low wavelengths
___c = high spectral resolution Mie signals/center line

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01.04.17 – 31.03.18											
2017	The channels are listed as mentioned in the HOI										
an	RF	355xt			387xt		532xc	532xp	607xt	1064xt	1064xt-dark
	TC	355xt			387xt		532xc	532xp	607xt	1064xt	
at	RF	355xt			387xt	532xt			607xt	1064xt	1064xt-dark
	TC	355xt			387xt	532xt			607xt	1064xt	
ba UPC_MRL	RF	355xt			387xt	532xt			607xt	1064xt	1064xt-dark
	TC	355xt			387xt	532xt			607xt	1064xt	532depcal
be	RF	355xt				532xt				1064xt	
	TC	355xt				532xt				1064xt	
	Dark	355xt				532xt				1064xt	
bg	RF	355xt			387xt						
	TC	355xt			387xt						
bu	RF	355xt			387xt		532xc	532xp	607xt	1064xt	1064xt-dark
	TC	355xt			387xt		532xc	532xp	607xt	1064xt	532depcal
ca near tele	RF	355nt			387nt	532nt			607nt	1064nt	1064nt-dark
	TC	355nt			387nt	532nt			607nt	1064nt	
ca far tele	RF	355ft			387ft	532ft			607ft	1064ft	1064ft-dark
	TC	355ft			387ft	532ft			607ft	1064ft	
ca dep tele	RF						532dc	532dp			532depcal
	TC						532dc	532dp			
cl	RF		355xc	355xp	387xt						355depcal
	TC		355xc	355xp	387xt						
co	RF					532xt			607xt		532depcal
	TC					532xp	532xc		607xt		
ev	RF	355xt			387xt	532xt	532xc		607xt	1064xt	
	TC	355xt			387xt	532xt	532xc		607xt	1064xt	532depcal
fi	RF	355xt	355xc		387xt	532xt	532xc		607xt	1064xt	355depcal
	TC	355xt	355xc		387xt	532xt	532xc		607xt	1064xt	532depcal
gp HSRL	RF	355xt				532xt				1064xt	532xtac
	TC	355xt				532xt				1064xt	532xtac
	Dark	355xt				532xt				1064xt	532xtac
gp HSRL	RF	313fta	313nta								313nta-dark
	TC	313fta	313nta								313fta-dark
gr LR321	RF	355xt			387xt		532xc	532xp	607xt	1064xt	1064xt-dark
	TC	355xt			387xt		532xc	532xp	607xt	1064xt	532depcal
gr LR111	RF		355xc	355xp	387xt						
	TC		355xc	355xp	387xt						355depcal
hh ARL2 near	RF	355nt			387nt	532nt			607nt	1064nt	1064nt-dark
	TC	355nt			387nt	532nt			607nt	1064nt	
hh ARL2 far	RF	355ft			387ft	532ft			607ft	1064ft	1064ft-dark
	TC	355ft			387ft	532ft			607ft	1064ft	
hh ARL2 dep	RF						532xc	532xp			
	TC						532xc	532xp			
is ADAM	RF	355xt			387xt		532xc	532xp	607xt	1064xt	1064ft-dark
	TC	355xt			387xt		532xc	532xp	607xt	1064xt	532depcal
ku	RF	355xt			387xt	532xt	532xc		607xt	1064xt	triggerdelay
	TC	355xt			387xt	532xt	532xc		607xt	1064xt	532depcal

la	RF	351xt			382xt						
	TC	351xt			382xt						
lc	RF	355xt			387xt	532xt			607xt	1064xt	1064ft-dark
	TC	355xt			387xt	532xt			607xt	1064xt	
le MARTHA	RF	355xt			387xt	532xt	532xc	532xp	607xt	1064xt	
	TC	355xt			387xt	532xt	532xc	532xp	607xt	1064xt	532depcal
le PollyXT_ift	RF	355xt	355xc		387xt	532xt	532xc		607xt	1064xt	355depcal
	TC	355xt	355xc		387xt	532xt	532xc		607xt	1064xt	532depcal
le PollyXT _lacros	RF	355xt	355xc		387xt	532xt	532xc		607xt	1064xt	355depcal
	TC	355xt	355xc		387xt	532xt	532xc		607xt	1064xt	532depcal
le PollyXT_sea	RF	355xt	355xc		387xt	532xt	532xc		607xt	1064xt	355depcal
	TC	355xt	355xc		387xt	532xt	532xc		607xt	1064xt	532depcal
ll LILAS	RF		355xc	355xp	387xt	530xt	532xc	532xp	1064xc	1064xp	355depcal
	TC		355xc	355xp	387xt	530xt	532xc	532xp	1064xc	1064xp	532depcal
	Dark								1064xc	1064xp	
lm	RF						532xc	532xp	607xt	1064xt	1064xt-dark
	TC						532xc	532xp	607xt	1064xt	532depcal
ma	RF	355xt			387xt	532xt			607xt	1064xt	
	TC	355xt			387xt	532xt			607xt	1064xt	
	Dark	355xt				532xt				1064xt	
mi MSTL-2	RF	355xt			387xt		532xc	532xp	607xt	1064xt	
	TC	355xt			387xt		532xc	532xp	607xt	1064xt	532depcal
	Dark	355xt					532xc	532xp		1064xt	
mi LMR-mob	RF	355xt			387xt		532xc	532xp	607xt	1064xt	
	TC	355xt			387xt		532xc	532xp	607xt	1064xt	532depcal
	Dark	355xt					532xc	532xp		1064xt	
mu POLIS	RF		355xc	355xp	387xt		532xc	532xp	607xt		355depcal
	TC		355xc	355xp	387xt		532xc	532xp	607xt		532depcal
ms MULIS	RF	355xt			387xt		532xc	532xp	607xt	1064xt	
	TC	355xt			387xt		532xc	532xp	607xt	1064xt	532depcal
	Dark	355xt					532xc	532xp		1064xt	
na MALIA high	RF	355xt			387xt		532xc	532xp	607xt		532depcal
	TC	355xt			387xt		532xc	532xp	607xt		
na MALIA low	RF	355xt					532xc	532xp			532depcal
	TC	355xt					532xc	532xp			
	Dark	355xt					532xc	532xp			
oh	RF	355xt			387xt	532xt	532xc		607xt	1064xt	
	TC	355xt			387xt	532xt	532xc		607xt	1064xt	532depcal
py	RF	356xt			387xt						358xtgr
	TC	356xt			387xt						358xtgr
pl IPRAL near	RF	355xt			387xt			532xt			
	TC	355xt			387xt			532xt			
pl IPRAL far	RF		355xc	355xp	387xt			532xt	607xt	1064xt	1064xt-dark
	TC		355xc	355xp	387xt			532xt	607xt	1064xt	355depcal
po MUSA	RF	355xt			387xt		532xc	532xp	607xt	1064xt	1064xt-dark
	TC	355xt			387xt		532xc	532xp	607xt	1064xt	532depcal
po PEARL	RF	355xt			387xt	532xt	532xc	532xp	607xt	1064xt	1064xt-dark
	TC	355xt			387xt	532xt	532xc	532xp	607xt	1064xt	532depcal
sf-CuBr	RF					510xt			578xt		

	TC					510xt			578xt		
sf-Cu&Au	RF					510xt			628xt		
	TC					510xt			628xt		
sf-NdYAG	RF						532xt			1064xt	1064xt-dark
	TC						532xt			1064xt	532xt-dark
th	RF	355xt			387xt	532xt	532xc	532xp	607xt	1064xt	
	TC	355xt			387xt	532xt	532xc	532xp	607xt	1064xt	532depcal
	Dark	355xt			387xt	532xt	532xc	532xp	607xt	1064xt	
wa	RF	355xt	355xc		387xt	532xt	532xc		607xt	1064xt	355depcal
	TC	355xt	355xc		387xt	532xt	532xc		607xt	1064xt	532depcal
wa near	RF	355nt		387nt		532nt			607nt		
	TC	355nt		387nt		532nt			607nt		
Legend	done	n.a.	not necessary	partial	RF = Rayleigh fit			TC = telecover			
updatetd 30.04.18											