

**ACTRIS-2**  
**WP2 – NA2: Profiling of aerosols and clouds**  
**2<sup>nd</sup> Workshop**  
**UPC**  
**Barcelona, 7 – 11 November, 2016**

## **Agenda**

**Monday, 7 November 2016**

**14:30 – 18:30**

**Welcome and Logistics**

**ACTRIS and WP2 updates**

**Optimization of aerosol profiling (Task 2.1)**

- Status of the network

**Optimization of aerosol profiling – Technical session (Task 2.1)**

- New instruments and capabilities
- Polarization

**Tuesday, 8 November 2016**

**9:00 – 18:30**

**Optimization of aerosol profiling – Technical session (cont'd) (Task 2.1)**

- Detection and acquisition
- Collaboration with WP6 – LiCal

**Status of ACP special issue (Task 2.4)**

**Optimization of aerosol profiling (cont'd) (Task 2.1)**

- EARLINET database
- SCC status and planned upgrades
- Training session on SCC v4.0 and calculation of new depolarization products

**Wednesday, 9 November 2016**

**8:30 – 16:00**

**Science day (Task 2.4)**

**Thursday, 10 November 2016**

**9:00 – 18:30**

**Optimization of cloud profiling (Task 2.2)**

- Status of the network and the database, planned upgrades and new developments at instrument and algorithm level
- Towards a European Radar Calibration Centre

**Instrument synergy - new data products and processing for studying cloud-aerosol-dynamics interaction (Task 2.3)**

- Cloud-aerosol interaction
- Wind and turbulence, PBL characterization

**EARLINET and Cloudnet in campaigns, support to new members and users (Task 2.4)**

- Training

- Support to campaigns and new sites
- Opportunities, external communities, collaboration with WP4 and WP5
- Wrap-up

**Friday, 11 November 2016**

**9:00 – 13:00**

**Side meeting: Cloudnet technical discussion**

- Introduction and status of the network
- Data transfer and FTP server
- Database
- Webserver
- Data processing
- Training and help

The ACTRIS-2 2<sup>nd</sup> WP2 workshop was held in Barcelona (Spain) from 7 to 10 November 2016, hosted by Universitat Politècnica de Catalunya (UPC), with an attendance of 92 participants, including representatives of 4 private-sector companies. It was followed on 11 November by a Cloudnet technical meeting (see minutes in a separate document). The workshop included a “Science Day”, scheduled on Wednesday 9 November, aimed at presenting scientific results resulting from ACTRIS-2 activities. Twenty-two posters (see list at the end of these minutes) related to different aspects of ACTRIS-2 were on display during the entire workshop, fostering discussion during the coffee breaks and during specific time allotted at the end of the Science Day.

### **ACTRIS and WP2 updates**

WP2 leader, Ulla Wandinger, summarizes WP2 structure, activities, and progress since the 1<sup>st</sup> WP2 workshop in Leipzig in November 2015. In particular, a good overview of progress made can be found in the ACTRIS-2 1<sup>st</sup> Periodic Technical Report, covering the period since the start of ACTRIS-2 to 31 August 2016, available at <http://www.actris.eu/LinkClick.aspx?fileticket=pJJkhKeGyhg%3d&portalid=46> (log-in required).

The ACTRIS-PPP project, devoted to prepare ACTRIS to become an operational research infrastructure of the European Research Area, will cover the period January 2017 - December 2019.

A general structure of the upcoming ACTRIS-2 General Meeting and Mid-Term Review to be held in Granada (Spain) from 30 January to 3 February 2017 is presented, emphasizing that participation of partners between 1 and 3 February is strongly recommended.

A call is made for contributions to the Science Meeting within the next ACTRIS-2 General Meeting, to be sent to Ulla Wandinger ([ulla@tropos.de](mailto:ulla@tropos.de)) and Adolfo Comerón ([comeron@tsc.upc.edu](mailto:comeron@tsc.upc.edu)) until 20 December 2016.

More details can be found in the presentation

- [WP2: Profiling of aerosols and clouds](#)

### **Task 2.1 Optimization of aerosol profiling**

#### Status of the network

Lucia Mona presents the status of the lidar network reminding the criteria for the stations to be considered active, joining (formerly new) or non-active (see deliverable [D2.4: Minutes of the first NA2 annual workshop](#), and presentation [here](#) for details). She also reminds the procedure for joining EARLINET. As of March 2016 the lidar network had 28 active stations and 9 joining stations (deliverable [D2.5: First report on technical upgrades and QA activities at EARLINET and Cloudnet stations](#)). Further details can be found in the presentation

- [Status of the network](#) (Lucia Mona, CNR-IMAA; Ulla Wandinger, TROPOS; Volker Freudenthaler, LMU).

The current status of the network is briefly presented by the stations PIs in an “around the table” format. A special description of the status of the Andøya station is given by Ingrid Hanssen in the presentation

- [The ALOMAR Troposphere Lidar](#) (Michael Gausa, Ingrid Hanssen, Andøya Space Center)

#### New instruments and capabilities

Anatoli Chaikovsky presents the activities for the study of atmospheric aerosols, clouds and earth surface in the Antarctic combining terrestrial and satellite monitoring, carried out by Belarus institutions at Mount Vechernyaya since 2006. Instrumentation includes a spectral albedometer, an AERONET sun-photometer (operated in close cooperation with LOA), a two-wavelength lidar and a multiwavelength Raman lidar with depolarization-measurement capability. The LIRIC algorithm is being applied to data from ground-based lidars and from CALIPSO overpasses. Lidar data from three seasonal campaigns have been gathered. EARLINET procedures are being applied to the lidars in the station, and the including of the Mount Vechernyaya station in EARLINET is being considered, which would be important for the future development of ACTRIS. The collected data are ready to be uploaded to the EARLINET database. For more details, see the presentation

- [Combined ground-based and satellite remote sensing of atmospheric aerosol and Earth surface in the Antarctic: Belarus lidar station in Antarctic](#) (Anatoli Chaikovsky et al., IPNASB)

Juan Antonio Bravo-Aranda presents the characteristics, status and outlook of the IPRAL system operating at the Palaiseau site since June 2015, as well as examples of internal checkup outcomes that are discussed among the audience. Details are found in the presentation

- [PL Station Technical Report](#) (Juan Antonio Bravo-Aranda et al., IPSL/LMD/SIRTA/CNRS)

Detlef Müller presents the lidar instrument under development at the University of Hertfordshire, intended as a lidar laboratory for air pollution monitoring, including the range-resolved chemical characterization of aerosols and trace gases using Raman scattering and fluorescence (bioaerosols). He also reviews the state of the art on aerosol microphysical retrieval using data from 3+2+ $\delta$  systems and the feasibility studies regarding aerosol chemical composition in synergy with Gwangju Institute of Science and Technology (GIST) in South Korea. A time line of the facility development at University of Hertfordshire is presented and a call is made to the EARLINET community for help, and also as an user as the facility becomes operative. For more details, see the presentation

- [University of Hertfordshire, UK: LIDAR Spectroscopy Instrument \(LiSsI\) for Chemical Profiling of Aerosol Pollution](#) (Detlef Müller, Matthias Tesche, UH; Boyan Tatarov et al.)

#### Polarization

Alejandro Rodríguez presents the configuration of the UPC lidar station, with emphasis in the new depolarization channel at 532 nm, along with preliminary results of calibration and depolarization measurements. Details are found in the presentation

- [Depolarization channel for Barcelona Lidar. Implementation and preliminary measurements](#) (Alejandro Rodríguez et al., RSLab-UPC)

Volker Freudenthaler gives a tutorial on the measurement and corrections of polarization effects in lidar systems, stressing the impact of the errors in the retrieval of

the microphysical properties of the aerosols, and explaining how to calculate the GHK parameters for the Single Calculus Chain (SCC), how to experimentally determine the parameters of the optical components in the lidar setup, and the depolarization of different lasers with second harmonic generators and third harmonic generators. The tutorial is illustrated with examples from the DWD RALPH Polly system in Hohenpeißenberg and from POLIS-6 system, as well as with a diattenuation measurement example. The availability on the EARLINET forum of a Python script for the calculation of the systematic errors in the depolarization measurements is reminded (<https://earlinetforum.imaa.cnr.it/viewtopic.php?f=3&t=225&p=501>). Details can be found in the presentation

- [Polarisation effects in lidar systems, measurements, corrections](#) (Volker Freudenthaler, LMU)

An offer is made by Volker Freudenthaler to hold a Webex seminar on the polarization topic if there is enough demand for it.

#### Detection and acquisition

Patrick Fréville presents the results of a collaboration between OPGC and UPC to enhance an UPC Labview lidar control application based on the Licel acquisition with some particularities requested and / or added by UPC. Details can be found in the presentation

- [A test of remote development based on the Licel acquisition software](#) (Patrick Fréville, OPGC-UPB-CNRS; Michaël Sicard, Adolfo Comerón, UPC)

From the methodological point of view there are no major problems, even though the approaches in the Clermont-Ferrand and the Barcelona systems are not exactly the same. Questions are raised about the formalization of the cooperation and about fairness with respect to Licel, as the basic code has been originated by that company. Gelsomina Pappalardo emphasizes that the formalization of the cooperation is already built-in in the project through the exchange of expertise actions. Giuseppe D'Amico calls for software modularization and for a repository of software modules. Ulla Wandinger stresses the spirit of collaboration, the open-source approach and the collaboration with the private sector promoted by ACTRIS-2.

Thomas Trickl summarizes his experience with small-size Hamamatsu photomultiplier tubes since 1995. He warns about stricter background-induced current limits in modern devices compared to older ones and on possible problems in the “gluing” of analog and photoncounting signals. Details can be found in the presentation

- [22 years of experience with small-size Hamamatsu PMTs](#) (Thomas Trickl, KIT-IMK-IFU)

#### Collaboration with WP6-LiCal

Livio Belegante gives an overview of the Lidar Calibration Centre and of the involved organizations and installation. He presents the TNA status and calls for users to send the lidar quality-assurance tests to Volker Freudenthaler using TNA (Trans-National Access). The activities in May 2016 in response to the 1<sup>st</sup> LiCoTest (Lidar Component Test) call are also presented, as well as planned upgrades of the test equipment, partly based on detected needs. It is reminded that, in addition to planned calls in 2017 to measure Mueller matrix components, access to LiCal is continuously opened to research institutes, private companies and public service sector and it is supported by TNA. Calls

are made for the identification of potential users inside and outside the ACTRIS community and for increasing LiCal visibility. Details can be found in

- [Activities at the Lidar Calibration Centre in support of aerosol profiling](#) (Livio Belegante, Baschir Laurentiu, INOE)

Aldo Amodeo presents the results of the Athens Lidar Intercomparison Campaign 2016 (ATHLI16) between the Athens EOLE lidar system and the Potenza MUSA transportable reference system, showing the improvements it achieved in EOLE, especially in terms of trigger delay adjustment and dark measurement subtraction in the 1064-nm channel, and revealing the need to use analog signals in the near range also for the Raman channels to avoid saturation effects. Further details can be consulted in the presentation

- [ATHLI16 - ATHens Lidar Intercomparison measurement](#) campaign (Aldo Amodeo, Guisepppe D'Amico, Nikolaos Papagiannopoulos, CNR-IMAA; Alex Papayannis, Athina Argyrouli, Maria Mylonaki, Georgios Tsaknakis, NTUA)

## EARLINET database

### *Status*

Lucia Mona informs on the EARLINET database status. In particular, the transfer from Hamburg to Potenza of the database and all the services has been completed, as well as a new software for user queries. The mailing list for contacting the EARLINET database team is [earlidbteam@imaa.cnr.it](mailto:earlidbteam@imaa.cnr.it). Data currently in the database are equivalent to level 2/1.5. Data categories in the database are reminded and statistics on the content, provision and use of the database are given (they can be consulted in the [presentation](#)). To provide coherent statistics from the data center, a definition for “dataset” has been agreed upon: one ACTRIS dataset is *one variable per year of measurement data with time resolution and measurement schedule as defined in appendix 1 in the ACTRIS data management plan*.

Warsaw and Dushanbe have been added to the database sites. Sites outside Europe can be added to the database as long as they operate according to the EARLINET standard.

With respect to data release, a balance is sought between the possibility of improving the data and avoiding continuous change. For this reason, while keeping the rule that finalized data cannot be changed, a versioning system will be added to the database in 2017.

The release of campaign data was discussed at the ACTRIS Data Centre workshop (Utrecht, 12-13 September 2016). The general approach is that data from the “standard” ACTRIS components (aerosols, clouds and trace gases) should go into the topical databases (EARLINET, Cloudnet and EBAS) and that combined and additional products could be provided as additional packages at a topical database or directly through the Data Portal. With respect to EARLINET, the policy is that the aerosol profiles should be included in the EARLINET database, but a data-embargo period could be decided depending on the campaign policy. Particular datasets designed for specific needs can be set up for the scientific community referencing the standard EARLINET files.

In the discussion it is emphasized that papers based on data should not be published until the data are public.

For details refer to the presentation

- [Status of EARLINET database](#) (Lucia Mona, Giuseppe D’Amico, Francesco Amato, CNR-IMAA; Holger Linné, MIM)

### *Quality check (QC) procedures*

Lucia Mona explains the need for defined and accurate quality-check procedures, required because of the EARLINET database evolution from a scientific internal database to an open, user-driven one. Quality check must serve the needs of the data originators and those of end users.

The QC approach under implementation is explained (see [presentation for details](#)). It will include a version control feature, which will make it possible to change already-public data. Checks to be implemented are classified into technical (labeled QC v1.0, related to the validity of the file content with respect to the EARLINET database file structure) and scientific (labeled QC v2.0, related to the physical validity of the parameters in the file) checks. Details of both kinds of checks being implemented are found in the [presentation](#).

Once implemented, the QC procedure will label the data in the current EARLINET database according to their quality level and will act on new submitted data during the submission phase. Only data compliant with the highest quality level will be included in the future database publications.

The timeline for the QC system implementation and further developments, involving consistence test of simultaneously acquired data in different files and correlation in temporal series, are presented (see [here](#) for details). Further checks based on feedback from LiCal and from climatological products are also considered.

For additional details consult the presentation

- [QC procedures](#) (Lucia Mona, Francesco Amato, Giuseppe D’Amico, CNR-IMAA)

In the ensuing discussion, it is made clear that automatic rejection will only happen for technical reasons, never for scientific ones, to avoid excluding real, extreme events. Concerns about the effect of the lidar overlap function on the MLH (mixing layer height) and the DLH (dust layer height) parameters are also expressed. This is recognized as a real possible problem that will be addressed with a change of name of the corresponding variables.

### *Novelties for files*

Lucia Mona explains the drivers (needs for traceability, required by fiducial measurements, interoperability, required to foster the data use by external users, and preservation, to assure the repeatability of studies and analyses) leading to changes in the data files. This entails in the near future (2017) adding the following attributes to the file contents: the database category, the QC version and the QC flag, and modifying the “dust layer height” variable name that has caused confusion in the past (candidate replacement is “aerosol boundary layer”, suggested in the ACTRIS-2 General Meeting in Frascati). Long-term adaptations include getting specific lidar variables into the Climate and Forecast (CF) standard name list to be used as CF metadata (long process anticipated, since it requires coordination with other aerosol lidar communities), file

versioning, linking data files to previous products in the processing chain, quality assurances tests and Handbook of Instruments, and the implementation of a persistent digital identifier (PID). For more details, see the presentation

- [Novelties for files](#) (Lucia Mona, Giuseppe D'Amico, Francesco Amato, CNR-IMAA).

#### *New services*

Giuseppe D'Amico updates on new EARLINET services.

Single sign-on for the EARLINET web-based services requiring authentication is being implemented under the Central Authentication Service (CAS) open-source protocol.

A THREDDS (Thematic Realtime Environmental Distributed Data Service) server (<https://login.earlinet.org:8443/thredds>) has been implemented on the EARLINET database to interface with the ACTRIS Data Centre and to improve and make more flexible the database. In particular, its OPeNDAP (Open-source Project for a Network Data Access Protocol) protocol allows an easy display of metadata.

A GARRLiC interface to SCC L1 products is under development with the goal of generating GARRLiC level 2 lidar products from the SCC L1 products. A first test has been performed on the 72-hour exercise preprocessed dataset, which has been provided to AERIS/ICARE using a dedicated sftp server. A first sample of GARRLiC products has been produced on data from the Bucharest station and is currently under evaluation. In the future GARRLiC is to be used on all the SCC L1 datafiles and the products will be transferred to the ACTRIS/EARLINET database.

It is planned to provide access to the SCC as a service for external users, employing the same interface as for internal users. This will require opening the EARLINET forum to external users as well, because the forum is the main information and support tool for the SCC. A proposal regarding the parts of the forum that would be open to external users is presented (see [presentation](#) for details). In January 2017 a decision on possible further opening will be made based on a balance between maximum openness and needs for explanations to external users.

For more details, see the presentation

- [New EARLINET services](#) (Giuseppe D'Amico et al., CNR-IMAA)

#### *Publication status*

Lucia Mona reminds that under H2020 rules each partner must ensure open access to the publications derived from the project. In addition, they must deposit at the same time the research data needed to validate the results presented in the scientific publication, ideally in a data repository. In the case of ACTRIS-2 lidar data, this means that data should be uploaded to the EARLINET database at latest by the time the publication is accepted and that the publication should clearly indicate where the data can be found. Furthermore, journals are increasingly requiring that data used for papers are published with doi or similar; for this reason, in the Data Centre workshop in Utrecht (12-13 September 2016) it was decided that NILU would offer the services of collecting data in the database and attributing doi for the user-selected data collection to be published.

With respect to EARLINET data, the second volume (May 2000 – April 2015) is being prepared for publication with doi in the Climate and Environmental Retrieval and Archive (CERA) database (<http://cera-www.dkrz.de/WDCC/ui/>). Station PIs will be soon contacted by email about authorship from each institution. Ongoing tasks before publication are quality assessment – as only those compliant with the highest QC will be published (50 kB of data expected) –, CF CERA format conversion, and an update of the database description. The next volume will include data acquired until May 2017.

Future issues being dealt with are the release of level 3 data and the ensuing publication, the linking of data to the published volumes, and different solutions for data publication. Possible solutions for making easier the citing of the data are discussed.

For details consult the presentation

- [Publication status](#) (Lucia Mona, CNR-IMAA; Holger Linné, MPIM; Giuseppe D’Amico, Francesco Amato, CNR-IMAA)

#### *New products and design of further products*

Lucia Mona reviews the structure of the ACTRIS Data Portal, the different product levels, and progress since the start of ACTRIS-2, in particular in what concerns the EARLINET database. Currently, we are in the phase of implementing level 2 products (quality-checked profiles of aerosol optical properties and layer properties). With respect to level 3 products (climatological and secondary tailored products), the procedures are almost completed.

A new naming of EARLINET data files is proposed, to allow for more flexibility and fostering appropriate use of the data. In the proposed structure, the file name would include the EARLINET word, the product level, the kind of product and the version; the suffix would always be “nc”. For level 1 products, harmonization with GALION, and possibly with E-Profile and TOPROF, will be sought. For level 1.5-2 data related to optical properties, the [CF](#) requests will have to be followed. For layering products, the [CF](#) standard nomenclature for averages and similar will have to be followed as well. These requirements will also apply to level 3 products. See the [presentation](#) for an example of file naming.

The identification of EARLINET products linking to JRA3 (Model evaluation, assimilation and trend studies) and to Copernicus needs is discussed. The Copernicus-related EC-ACTS (EARLINET and Cloudnet - Aerosol and Cloud Team for Sentinel-5 Precursor Validation) cal/val activity is presented.

For more details, consult the presentation

- [New Products](#) (Lucia Mona, Giuseppe D’Amico, Francesco Amato, CNR-IMAA)

#### *Report from the 8<sup>th</sup> ICAP meeting*

Ioannis Biniotoglou reports on the 8<sup>th</sup> International Cooperative for Aerosol Prediction (ICAP) meeting that took place in College Park, MD, USA, from 12 to 14 July 2016, with the theme “Lidar Data and its use in Model Verification and Data Assimilation”. Several global models will attempt soon to assimilate lidar profiles. Modelers require attenuated backscatter profiles with high quality (good, documented error characterization is more important than quantity), cloud-free guaranteed; aerosol type is

a welcomed feature. Lidar profiles for assimilation should come from stable, long-term stations. EARLINET is a very promising tool for these purposes, but we miss a couple of "showcase" stations, with on-line accessible data in real time, to promote our efforts. For details see the presentation

- [Report from 8<sup>th</sup> ICAP meeting](#) (I. Binietoglou, NOA)

A [call](#) is made to set up a task force for specific data provision responding to modeller needs.

### SCC status and planned upgrades

#### *Release of the new SCC version 4.0*

Giuseppe D'Amico reports on the novelties of SCC version 4.0, to be released by the end of November 2016 (<https://scc.imaa.cnr.it>), with emphasis on the new depolarization products. Incompatibilities with version 3.11 are highlighted, stressing that, for systems with no depolarization-measurement capabilities, version 4.0 is used exactly in the same way as version 3.11. String variables are accepted to identify channels in version 4.0, but backward compatibility is assured. No automated reanalyses of products obtained with previous SCC versions will be performed, but it is recommended to re-run all the raw datasets submitted to older versions in the new one, as several improvements have been made and bugs have been fixed. For details it is strongly recommended to consult the presentation

- [Release of new SCC v4.0](#) (SCC development team)

#### *New SCC depolarization products – testing and validation*

Ina Mattis presents the new features and improvements in the EARLINET Lidar Data Analyzer (ELDA) SCC module in passing from ELDA v2.1 (included in SCC v3.11) to ELDA v3.06 (included in SCC v4.0). Testing has been made against manual inversion with data from the Potenza and Leipzig systems, as well as with data from POLIS and the DWD RALPH-Polly system in Hohenpeißenberg during an intercomparison campaign in September 2016. For details see the presentation

- [ELDA from v2.1 to v3.06 \(SCC 3.11 to 4.0\)](#) (Ina Mattis, DWD)

A call is made for EARLINET members to join the SCC development group and to use the EARLINET forum for feedback on the SCC.

#### *SCC new developments*

Giuseppe D'Amico reports on new developments not included in SCC v4.0, but underway. New products include high-resolution pre-processed products (useful as inputs for LIRIC and GARRLiC, for Cloudnet and to generate quicklooks), cloud masking, automatic aerosol layering, and aerosol multiwavelength optical products. A quicklook-generating module and web interface are also under development. A call for SCC testers is made; interested people should contact Giuseppe D'Amico at [giuseppe.damico@imaa.cnr.it](mailto:giuseppe.damico@imaa.cnr.it). With respect to the reporting system, it is reminded that feedback was requested in the 1<sup>st</sup> WP2 workshop in Leipzig by February 2016, none having been received so far. It appears that the reporting system is not considered useful and will be dropped from the SCC development.

For details and time schedule see the presentation.

- [New SCC developments](#) (SCC development team)

#### *Automatic cloud masking*

Ioannis Biniotoglou reminds that SCC retrievals require cloud-free condition and the problem to exclude clouds from the submitted data in an objective, quality-controlled way. He exposes advantages and drawbacks of possible approaches, points out possible ways forward and calls for ideas and suggestion from the WP2 community. For details see the presentation

- [Automatic cloud masking: workflow and issues](#) (Ioannis Biniotoglou, INOE and NOA)

In the discussion it is pointed out that multiple-scattering situations should also be excluded and a cloud-masking criterion based on temporal variability is suggested.

#### Contributed presentations

Kalliopi Voudouri gives the contributed presentation

- [Long-term comparison of lidar derived optical products between the Single Calculus Chain and the operational algorithm of Thessaloniki station](#) (Kalliopi Voudouri, Nikolaos Siomos, AUTH; Elina Giannakaki, NTUA, FMI; Vassilis Amiridis, NOA; Dimitris Balis, AUTH)

comparing results of the SCC and of the Thessaloniki station algorithm on aerosol backscatter- and extinction-coefficient profiles for the period February 2001 – August 2015. The general conclusion is a good agreement between both algorithms, in spite of some issues (see the [presentation](#) for details). In the discussion Giuseppe D’Amico suggests repeating the analysis with SCC v4.0.

#### Training session on SCC v4.0 and calculation of new depolarization products

A training session on the SCC v4.0 takes place, including a presentation of the theoretical background and how to generate the raw calibration datasets for depolarization measurements by Giuseppe D’Amico, and a real on-line example led by Ina Mattis. Materials can be consulted in the presentation

- [SCC v4.0 training](#) (SCC development team)

### **Task 2.2. Optimization of cloud profiling**

#### Status of the network and the database, planned upgrades and new developments at instrument and algorithm level

Ewan O’Connor presents the status and progress of Cloudnet.

The Cloudnet database transfer to FMI has been completed for the ACTRIS sites and data are available through the ACTRIS Data Portal, including near real time (NRT) data and quicklooks kept at <http://cloudnet.fmi.fi/quicklooks>. Campaign quicklooks of data

processed with Cloudnet algorithms are found under [http://cloudnet.fmi.fi/quicklooks/campaign\\_sites.html](http://cloudnet.fmi.fi/quicklooks/campaign_sites.html).

The new data transfer server is in operation, and a [THREDDS](#) server and Single Sign-On (SSO) service are in testing.

Column profiles from model data needed for calibration and correction will be available in common format for all Cloudnet and EARLINET ACTRIS sites (see [presentation](#) for details). They will also be available on request for campaigns and new sites.

With respect to uncertainty in measurements, within Cloudnet random uncertainty and potential bias are considered. Calibration addresses potential bias. Because calibration is not always continuous, two data versions are held in the database, namely near real time data and final quality-checked data for publication.

New or updated products include turbulent properties, additional classifications (aerosol type and boundary layer type from Doppler lidar) and humidity. Improvements in classification of super-cooled liquid water layers are under test.

The KNMI and SMHI HARMONIE NWP model is being tested in multiple versions to test different parameterizations.

New instrumentation at Cloudnet sites includes:

- New FMCW radar from RPG and updates of BASTA, which are operated in multiple range-length modes to obtain a much smaller blind zone allowing fog detection.
- Doppler lidars from Halo Photonics (Stream Line), Leosphere (WindCube 200S) and Lockheed Martin (WindTracer) with very versatile scanning versions.

Cloudnet-related teaching and training will comprise in 2017 a Cloudnet Training School in Limassol on 27-31 March 2017, co-organized by TROPOS and the Cyprus Institute of Technology (see <http://www.actris.eu/Events/>), and an Arctic Cloud Winter School in Hyytiälä, co-organized by the universities of Helsinki and Leipzig under (AC)<sup>3</sup>.

More details can be found in the presentation

- [ACTRIS - Cloudnet overview](#) (Ewan O'Connor, FMI)

Ulrich Löhnert presents progress on drizzle classification based on the Doppler spectrum skewness. For details and examples see the presentation

- [Detection of drizzle onset with cloud Doppler spectrum moments](#) (C. Acquistapace, S. Kneifel, U. Löhnert, University of Cologne; P. Kollias, Stony Brook University)

Alexander Myagkov presents Radiometer Physics solid-state cloud radars in relation with different ACTRIS-2 subtasks: calibration (task 2.2.2), Doppler spectra (task 2.2.1), and synergy (task 2.3.1). Details can be found in the presentation

- [Solid state cloud radars for atmospheric research](#) (Alexander Myagkov, Thomas Rose, Radiometer Physics GmbH)

In the discussion Ulla Wandinger suggests a possible collaboration between the developers of the Cloudnet processing chain and the company.

### Towards a European Radar Calibration Centre

Herman Russchenberg gives an overview of the implications, assumptions and complications in cloud radar calibration (see [presentation](#) for details). He points out practical issues and presents a classification of calibration procedures: system calibration (determination of system constant(s) plus errors), system cross-checks (intercomparison of different radars), and microphysical cross-checks (consistency checks of radar measurements against measurements from other types of instrument). As an example, preliminary results of system calibration at CESAR (Cabauw) using reflective spheres suspended from a drone are presented, along with issues to be addressed. The radar calibration radar concept and planning are outlined. More details can be found in the presentation

- [Towards a radar calibration facility](#) (Herman Russchenberg, TU Delft)

Anthony Illingworth presents progress on absolute calibration of cloud radars and corrections for wet radome attenuation. He discusses the calibration accuracy (1 dB) needed for Cloudnet, presents methods for calibrating 35 GHz radars to 0.5 dB through comparison to rain-calibrated (using redundancy of polarization parameters in rain) 3 GHz radars, and for self-calibrating 94 GHz radars using rain. He outlines the effects of wet antenna/radome and future work for their correction. For details see the presentation

- [Absolute calibration of cloud radars and correction for attenuating wet radomes/antennas](#) (John Nicol, Anthony Illingworth, University of Reading; Chris Walden, STFC – Chilbolton)

Martial Haeffelin presents the evaluation of two independent techniques for calibrating cloud radars (use of reference target and cross-check with a reference radar) and of two independent methods to validate the calibration (Z from radar vs rain rate from disdrometer and Z from radar vs drop size distribution or liquid water path from a light optical aerosol counter or a microwave radiometer, respectively). For details and results see the presentation

- [Cloud radar calibration activities at SIRTA Observatory: radar inter comparisons, target calibration, and in-situ vs remote sensing](#) (Jean-Charles Dupont, Julien Delanoë, Martial Haeffelin, IPSL-SIRTA; Eivind Waersted, LMD; Christophe Le Gac, Jean-Paul Vinson, LATMOS; Gaelle Clain, MODEM)

Patric Seifert presents an evaluation of cloud radar calibration in the framework of the HOPE (High-definition clouds and precipitation for advancing climate prediction - Observational Prototype Experiment) campaign (9-27 September 2013), comparing radar-measured reflectivity with the calculated one from droplet size distribution measured using a phase Doppler interferometer (PDI) on board the airborne ACTOS payload. For details and results consult the presentation

- [Evaluation of the cloud radar calibration using in-situ observations of a stratocumulus cloud at ACTRIS site Melpitz](#) (Patric Seifert, Holger Siebert, TROPOS)

Ulrich Löhnert stresses the importance of LWP measurements from ground-based microwave radiometers for Cloudnet, and presents the ACTRIS central calibration facility for these instruments being implemented at the Jülich Observatory for Cloud Evolution (JOYCE) with the collaboration of manufacturers. Results of an improved

calibration load for the RPG-HAPTRO G5 microwave radiometer, compatible with older instruments, are presented. For results and details see the presentation

- [Improvements in MWR calibration](#) (U. Löhnert, N. Kuchler, B. Pospichal, University of Cologne; T. Rose, H. Czekala, Radiometer Physics GmbH; the TOPROF WG3)

### **Task 2.3. Instrument synergy – new data products and processing for studying cloud-aerosol-dynamics interaction**

#### Cloud-aerosol interaction

Herman Russchenberg presents a comparative study on indices of indirect effect of aerosols on clouds, their significance and their convenience for measuring with ground-based equipment. For conclusions and details, consult the presentation

- [Monitoring Aerosol - Cloud Interactions in liquid water clouds](#) (Karolina Sarna, Herman Russchenberg, Christine Knist, TU Delft)

#### Wind and turbulence, PBL characterization

Ewan O'Connor presents progress on boundary-layer classification using Doppler lidar products and ancillary data. For details and conclusion, see the presentation

- [BL classification developments](#) (E. O'Connor, UoR/FMI; Antti Manninen, UHEL; Tobias Marke, University of Cologne)

Martin Radenz presents the combination of data from cloud radar, radiofrequency wind profiler and wind lidar to retrieve vertical air motion inside clouds and terminal fall velocity in an algorithm that can be applied operationally, illustrated with examples of the COLRAWI campaign in 2015. For details see the presentation

- [Observation of in-cloud vertical Air Motion by combining wind profiler and cloud radar](#) (Martin Radenz, Johannes Bühl, TROPOS)

Ewan O'Connor presents results of an intercomparison of turbulence measurements with data from sonic anemometers disposed at different heights on a 127-m tower and data from a wind lidar, related to ACTRIS JRA2 (The surface exchange and vertical transport of aerosols). For details and conclusions see the presentation

- [Turbulence intercomparison: Doppler lidar and Mast](#) (Pyy Pentikainen, UHEL; Ewan O'Connor, FMI; Antti Manninen, UHEL)

Jana Preißler presents the results of an experimental study on the stability of a Leosphere WindCube 200S Doppler lidar. Details and results can be found in the presentation

- [Performance stability of Leosphere WindCube 200S at Mace Head, Ireland](#) (Jana Preißler, NUIG; Ludovic Thobois, Leosphere; Ewan O'Connor, FMI; Colin O'Dowd, NUIG)

## **Task 2.4. EARLINET and Cloudnet in campaigns, support to new members and users**

### Training

Doina Nicolae reports on the 1<sup>st</sup> LiCal workshop, held in Bucharest from 23 to 27 May 2016, linked to the East European Centre for Atmospheric Remote Sensing (ECARS) Summer School (23 May – 3 June 2016), and focused on instruments, during which some participants also accessed the Lidar Component Test (LiCoTest) facility. She gives an overview of the schedule and scope of future training workshops (see [presentation](#) for details) and emphasizes the opportunity for technical discussions they provide in a framework of accelerated developments with respect to quality assurance and the SCC. For further details, check the presentation

- [LiCal training workshops](#) (Doina Nicolae, INOE)

Johannes Bühl presents the Cloudnet Training School that will be held in Limassol from 27 to 31 March 2017, co-organized by TROPOS and the Cyprus University of Technology (CUT). The school will consist of morning lectures presenting technical basics of radar, lidar and microwave radiometer, introduction to Cloudnet data processing and a tutorial on how to set up a LACROS-type Cloudnet station, as well as of afternoon workshops on implementation of new methods. For details, consult the presentation

- [The Cloudnet Training School - 27-31 March 2017, Limassol](#) (Johannes Bühl, Patric Seifert, Ronny Engelmann, Heike Kalesse, Martin Radenz, TROPOS; Rodanthi Mamouri, Argyro Nisantzzi, CUT; Ewan O'Connor, FMI)

### Support to campaigns and new sites

Ewan O'Connor outlines support provided by Cloudnet to new stations and campaigns, including support for Doppler lidar processing code and products, and NWP data. Quicklook storage and dissemination and teaching activities are also supported. Examples of new stations and already supported campaigns are given. For details, see the presentation

- [Cloudnet: Support for new campaigns](#) (Ewan O'Connor, UoR/FMI)

Marco Rosoldi describes the INTERACT-II (INTERcomparison of Aerosol and Cloud Tracking) campaign, started at CIAO atmospheric observatory in Potenza on 1<sup>st</sup> of July 2016 and ongoing until 10 January 2017, to evaluate the performance of commercial automatic lidars and ceilometers for aerosol/cloud measurements. Detailed goals, involved instruments and the inter-comparison strategy, as well as partial results, are presented. Details can be found in the presentation

- [Measurement campaign at CNR-IMAA to evaluate performances of automated systems for aerosol vertical distribution study](#) (Fabio Madonna, Marco Rosoldi, Gelsomina Pappalardo, CNR-IMAA; Joshua Vande Hey, University of Leicester; Campbell Scientific team; Vaisala team; Sigma Space team)

Anatoli Chaikovsky presents the specific campaign planned in 2017 to validate the synergy between data from AERONET, EARLINET and other GALION lidar networks and CALIPSO. Specific goals are the development and test of algorithms to retrieve aerosol mode concentration profiles from CALIPSO and AERONET data, and to integrate ground-based lidar, AERONET and CALIPSO data for monitoring long-range

aerosol changes. Ground-based lidar stations must have a collocated AERONET sun-photometer and must provide lidar backscatter signals at 355 nm, 532 nm, and 1064 nm from 500 m or less to 5000 m or more. It is agreed to change the initially proposed date of the campaign (September 2017) to April-May 2017. For more details, see the presentation

- [Synergy of AERONET, EARLINET\(+\) and CALIPSO data: Specific validation campaign, 2017](#) (Anatoli Chaikovsky, IPNASB)

Arnoud Apituley gives an overview of the CINDI-2 (Cabauw Intercomparison Campaign of Nitrogen Dioxide measuring Instruments) campaign, carried out at CESAR observatory in Cabauw in September 2016, highlighting connections with ACTRIS-2 JRA1 (Improving the accuracy of aerosol light absorption determinations) and JRA2 (The surface exchange and vertical transport of aerosols). For details, results and conclusions consult the presentation

- [CINDI-2 Overview](#) (Arnoud Apituley, KNMI, and the CINDI-2 organizers and CINDI-2 participants)

Lucas Alados-Arboledas reports on the SLOPE (Sierra Nevada Lidar AerOsol Profiling Experiment) campaign, carried out from May to September 2016 and linked to ACTRIS-2 JRA1 (Improving the accuracy of aerosol light absorption determinations). The campaign combined aerosol active and passive remote sensing with in-situ measurements at different levels in the northern slope of Sierra Nevada, near Granada, and in the CEAMA site in Granada, plus several aerosol profiles from an instrumented plane. Goals are testing lidar stand-alone night-time retrievals and testing of the GARRLiC-GRASP algorithm. For details on instrumentations, sites, methods and results, consult the presentation

- [Study of the atmospheric aerosol by multiple approaches during SLOPE: Contribution to ACTRIS2 WP11](#) (Lucas Alados-Arboledas, IISTA-CEAMA-UGR, and SLOPE organizers and SLOPE participants)

Alexandra Tsekeri presents the JRA1-related campaigns in Athens and Cyprus, devoted to advance knowledge on absorption profiling by optimizing in-situ measurement techniques and remote-sensing retrievals. Retrievals have made use of the latest GARRLiC-GRASP version, available at <http://www.grasp-open.com/>, which can be installed using the virtual machine installer at [https://bitbucket.org/iannis\\_b/vagrant-grasp](https://bitbucket.org/iannis_b/vagrant-grasp). For details, results and conclusions, see the presentation

- [JRA1 activities in Athens and Cyprus: Aerosol absorption vertical profiling utilizing the synergy of lidar, sunphotometry and in situ measurements](#) (Alexandra Tsekeri, Vassilis Amiridis, NOAA, the campaign organizers and the campaign participants)

Johannes Bühl gives an overview of TROPOS activities in the Eastern Mediterranean, focusing on the activities in Cyprus during the ongoing (October 2016 – August 2017) CyCARE (Cyprus Aerosol, Clouds and pRecipitation Experiment) campaign and making a call for more participants in the experiment. In the discussion, the possibility of the DLR Falcon overflying as well the Finokalia site is brought up. For details and preliminary results, consult the presentation

- [The Cyprus Aerosol, Clouds and pRecipitation Experiment](#) (CyCARE) (Johannes Bühl, Patric Seifert, Ronny Engelmann, Albert Ansmann, TROPOS; Rodanthi Mamouri, Argyro Nisizantzi, CUT)

Vassilis Amiridis informs on the ACTRIS and ERC/A-LIFE campaigns ([see presentation for details](#)), and of the opportunities offered by ACTRIS TNAs in Finokalia and by EUFAR TNAs. He also reports on educational activities and on ESA clustered activities ([see presentation for details](#))

### Opportunities, external communities, collaboration with WP4 and WP5

#### *ESA requests to the ACTRIS community*

Vassilis Amiridis informs of an invitation he has received from ESA to submit ACTRIS-related requests for future Earth observation missions. He asks to provide possible proposals to him by the end of the year. He requests participants in the workshop to inform the EARLINET Council in case of being approached by ESA, Copernicus or other organizations in connection with lidar-related space missions.

#### *WP2 input for WP4 and WP5, general ACTRIS issues*

Gelsomina Pappalardo highlights the connection between WP2 and other ACTRIS-2 work packages and focuses on WP4 (ACTRIS Innovation Platform), whose overall objective is to enhance and promote cooperation with the private sector and, in particular, with European SMEs. She reminds the specific objectives of WP4 and gives examples of how WP2 has contributed to them. To help WP4 to define a strategy to facilitate technology transfer and instrument development and testing, she calls for the cooperation of WP2 participants who might have experience in management of intellectual property rights reacting quickly to the requests of the ACTRIS Coordination Office on this subject.

She reviews the specific objectives of WP5 (ACTRIS-2 training, outreach and sustainability actions) and gives examples of actions already carried out or ongoing, including links to external projects and programs, opportunities and upcoming conferences. She asks the audience to inform the ACTRIS Coordination Office about relevant events that can offer opportunities for outreach.

For details, consult the presentation

- [WP2 input for WP4 and WP5, general ACTRIS issues](#) (G. Pappalardo, CNR-IMAA)

#### Science day

A “science day”, devoted to present scientific results and knowledge from or connected to ACTRIS developments, was held on Wednesday 9 November. It was organized in the following three sessions (presentations available on the workshop website, login required):

*Session 1 (Chairs: [Lucja Janicka](#), [IGF-UW](#) and [Eleni Marinou](#), [NOA](#))*

- [Profiling of dust, dust-smoke mixture and cirrus in SHADOW2 campaign](#) ([Qiaoyun Hu](#), [P. Goloub](#), [T. Podvin](#), [I. Veselovskii](#), [V. Bovchaliu](#), [A. Lopatin](#), [D. Tanré](#), [O. Dubovik](#), [B. Torres](#), [L.Revillini](#), [S. Crumeyrolle](#), [T. Lapyonok](#), [C. Derook](#), [LOA-Université de Lille 1](#), [CNRS](#))

- [Using the lunar aureole derived from all-sky cameras for the retrieval of aerosol microphysical properties](#) (R. Román, IISTA-CEAMA-UGR; et al., LOA-Université de Lille, GRASP, UVA, AEMET, Università del Salento)
- [Water vapour, temperature and aerosol retrievals using RALMO Raman LIDAR at Payerne](#) (G. Martucci, A. Haefele, L. Renaud, MeteoSwiss; V. Simeonov, EPFL)
- [Investigating the quality of modelled aerosol profiles based on combined lidar and CIMEL data](#) (N. Siomos, D.S. Balis, A. Poupkou, N. Liora, S. Dimopoulos, D.Melas, M. Filioglou, AUTH; S. Basart, BSC; A. Chaikovsky, IPNASB)
- [Extinction retrieval using a polarization elastic lidar at Finokalia, Crete](#) (Elina Giannakaki et al., FMI)
- [Distance-based classification on EARLINET data](#) (Nikos Papagiannopoulos, Lucia Mona, CNR-IMAA)
- [Aerosol type – a potential new data product from EARLINET standard optical profiles](#) (Doina Nicolae, INOE).

An associated demo was carried out of the NATALI (Neural network Aerosol Typing Algorithm based on Lidar data, <http://natali.inoe.ro>) software for aerosol typing, whose results were used in the previous presentation.

*Session 2 (Chairs: Alberto Cazorla, IISTA-CEAMA-UGR and Ingrid Hanssen, Andøya Space Center)*

- [Properties of aerosol over Warsaw EARLINET station on the basis of 2 years Raman lidar observations](#) (Iwona S. Stachlewska, Łucja Janicka, Dominika Szczepanik, Wojtek Kumala, IGF-UW)
- [LIRIC for synergetic processing of EARLINET, AERONET and CALIPSO data: method development and testing](#) (A. Chaikovsky, N. Denishchik-Nelubina, A. Fedarenka, IPNASB)
- [Estimated desert-dust ice nuclei profiles from CALIPSO](#) (Eleni Marinou, Vassilis Amiridis, NOA; et al., TROPOS, AUTH, CUT, LOA-Université de Lille 1, Cyprus Institute, TU Delft)
- [EARLINET validation of CATS L2 product](#) (Emmanouil Proestakis, Vassilis Amiridis, NOA ; et al. TROPOS, NOA)
- [Estimation of mineral dust direct radiative forcing at the European Aerosol Research Lidar NETwork site of Lecce, Italy, during the ChArMEx/ADRIMED summer 2013 campaign: Impact of radiative transfer model spectral resolutions](#) (Rubén Barragán, UPC; Salvatore Romano, Università del Salento; et. al., UPC, Università del Salento)
- [Aerosol properties over the Paris megacity monitored using a multi-wavelength Raman Lidar](#) (J. A Bravo-Aranda, C. Pietras, M. Haeffelin, F. Lapouge, SIRT-IPSL)

*Session 3 (Chairs: Juan Antonio Bravo-Aranda, SIRTA-IPSL and Montserrat Costa-Surós, University of Cologne)*

- [The Iberian Ceilometer-radiometer Network: monitoring an exceptional dust event](#) (Alberto Cazorla, IISTA-UGR; et al. IISTA-UGR, UVA, Universidad de Extremadura, CSIC)
- [Aerosol in stratospheric intrusion layers](#) (Thomas Trickl, Hannes Vogelmann, IMK-IFU; et al.)
- [Exploring microphysical, radiative, dynamic and thermodynamic processes driving fog and low stratus clouds using ground-based Lidar and Radar measurements](#) (Martial Haeffelin, Eivind Waersted, Jean-Charles Dupont, IPSL; Marc-Antoine Drouin, LMD; Juan Antonio Bravo-Aranda, IPSL; Quentin Laffineur, RMIB)
- [PallasCloud Experiment, PACE-2015-combining different scales of observation](#) (A. Hirsikko, E. J. O'Connor, D. Brus et al., FMI)
- [Optical parameters and vertical profiles of cloud layers from the different kind of solar radiation observations](#) (Irina N. Melnikova, St. Petersburg State University)

#### Posters

The following posters were exhibited during the entire workshop:

##### *Technical section*

- C. R. Marcos, J. L. Gómez-Amo, M. P. Utrillas, J. A. Martínez-Lozano: [Noise level estimation of the RMAN510 analog channel measurements](#)
- C.R. Marcos, J.L. Gómez-Amo, M.P. Utrillas, J.A. Martínez-Lozano: [Electronic background correction of Vaisala CL51 ceilometer at Burjassot, Spain](#)
- L. Ilic, M. Kuzmanoski, Z. Mijic: [Preliminary results of analysis of the lidar measurements in Belgrade](#)
- D. Balis, N. Siomos, K. Voudouri, V. Freudenthaler: [Inspection of the Thessaloniki Lidar for problems in the depolarization measurements and calibration](#)
- D. Alexiou, A. Papayannis, F. Rocadenbosch, A. Argyrouli, G. Tsaknakis, and P. Kokkalis: [Planetary Boundary Layer height variability over Athens, Greece based on the synergy of Raman lidar and radiosonde data: Application of the Kalman filter versus other techniques](#)
- I. Biniotoglou, P. Giampouras, L. Belegante: [A fast and precise linear approximation of Rayleigh-Brillouin scattering spectra, suitable for real-time HSRL processing](#)
- I. Biniotoglou, M. Kottas, V. Palea: [A new open-source python library for lidar data processing](#)

##### *Scientific section*

- M. Mylonaki, A. Papayannis, R. Mamouri, A. Argyrouli, P. Kokkalis, G. Tsaknakis, and O. Soupiona: [Variability of the aerosol optical properties during biomass burning events observed by Raman lidar over Athens, Greece in the period 2007-2016](#)

- M.Filioglou et al.: [Intercomparing water vapor profiles from a Raman lidar, a satellite and a model in Finland](#)
- J. A. Benavent-Oltra, R. Román, D. Pérez, M. J. Granados, P. Ortiz Amezcuca, J. L. Guerrero-Rascado, A. Lopatin, C. Denjean, B. Torres, D. Fuertes, O. Dubovik, H. Lyamani, F. J. Olmo, M. Mallet, L. Alados-Arboledas: [Atmospheric Aerosol Microphysical Profiling: GRASP retrieval versus airborne measurement](#)
- I. S. Stachlewska, D. Szczepanik, L. Janicka, H. Baars, R. Engelmann: [Biomass burning particles detected by Raman lidar over Warsaw on 10th August 2015](#)
- S. Nickovic, B. Cvetkovic, F. Madonna, M. Rosoldi, G. Pejanovic, S. Petkovic, J. Nikolic: [Cloud ice caused by atmospheric mineral dust – Parameterization of ice nuclei concentration in the NMME-DREAM model](#)
- C.R. Marcos, J.L. Gómez-Amo, M.P. Utrillas, J.A. Martínez-Lozano: [Operational retrieval of aerosol backscatter profiles from continuous ceilometer measurements over Burjassot EARLINET station](#)
- C. Córdoba-Jabonero, A. Ansmann, M. Sicard, H. Baars: D. Bortoli, S. N. Pereira, M. J. Costa, A. M. Silva, P. S. Kulkarni, M. Potes: [On the desert dust aerosols over Évora - Surface, columnar, and profiling of optical and microphysical properties](#)

#### *Task 2.2 section*

- J. Delanoë et al: [BASTA Doppler Cloud radar: multiple size and sensitivities, mobile, scanning](#)

#### *Task 2.3 section*

- L. Belegante: [Magurele center for Atmosphere and Radiation Studies \(MARS\)](#)
- R. Gierens, A. Hansen, M. Costa-Surós, U. Löhnert, S. Crewell: [Comparing Cloudnet classification of mixed-phased clouds to high resolution cloud resolved model](#)

#### *Task 2.4 section*

- G. de A. Moreira, J. L. Guerrero-Rascado, P. Ortiz-Amezcuca, Román R. Benavent-Oltra, L. Alados-Arboledas: [Atmospheric turbulence during SLOPE using Doppler and Elastic lidar](#)
- D. Mamali, E. Marinou, M. Kottas, I. Biniotoglou, P. Kokkalis, A. Tsekeri, V. Amiridis, M. Pikridas, J. Sciare, S. Bezantakos, A. Ansmann, R. Engelmann, H. Russchenberg, G. Biskos: [Mass concentration profiles from LIDAR and In-Situ \(Drones\) measurements over Cyprus](#)
- M. Váňa, A. Holubová Šmejkalová, V. Ždímal, J. Klánová: [Research infrastructure ACTRIS-CZ](#)

#### **Miscellaneous**

### AMT and ACP EARLINET special issues

Ulla Wandinger reviews the status of the papers submitted to the AMT special issue on EARLINET and calls for the not yet submitted papers.

Vassilis Amiridis reminds the aim of the ACP EARLINET special issue, reviews the identified paper categories and the status of the already submitted papers, and gives an overview of planned papers. The overview and novelty aspects of the papers in this special issue are stressed, as well as the importance of presenting of trends.

Check the status and overviews of papers in both special issues [here](#).

### **Wrap-up**

Ulla Wandinger considers that WP2 is making good progress, and points out the work needed on databases and calibration centers to support the soon-to-start ACTRIS Preparatory Phase Project. She reminds the upcoming ACTRIS-2 General Meeting (Granada, 30 January – 3 February 2017).

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