

## EARLINET

### The European Aerosol Research Lidar Network: Project Summary and Outlook.

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- **Project objectives**
- **Project achievements**
- **What to maintain?**
- **What to improve?**
- **Which structure?**
- **Funding?**

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## **Objectives**

- **Establish a comprehensive data base of the aerosol vertical distribution over Europe:**
  - layer structure,
  - optical properties (extinction, optical depth, backscatter),
  - phenomenology or microphysics.
- **Identify and quantify sources of aerosol.**
- **Assess the effect on the radiation budget, in particular in the UV.**
- **Assess the importance of special events (Saharan dust, forest fires, etc.).**
- **Assess the importance of long range transport.**
- **Provide ground truth for spaceborne remote sensors.**
- **Foster new observation and retrieval methods.**

## **Technical Objectives**

- **Establish a network of 18 stations distributed over a large part of Europe**
- **Operate advanced lidar instruments.**
- **Use quantitative retrieval methods to the largest possible extent.**
- **Apply strict quality control.**
- **Establish an observation scheme for “unbiased” sampling.**
- **Establish a scheme for coordinated measurements on special demand.**
- **Improve instrumentation and observation schemes.**
- **Establish a common data set including common format.**

## **Achievements**

- **Created a set of quality controlled sophisticated lidar systems for routine observations from a set of instruments for a variety of research-only purposes, using almost exclusively internal funds!**
- **Created by far the largest climatological data set for aerosol vertical and horizontal distribution.**
- **Performed systematic measurements under a large variety of conditions.**
- **Created by far the largest data set for Saharan dust distribution over Europe.**
- **Performed a large variety of special process studies.**
- **Created a well organised community for aerosol profile observations and associated studies.**

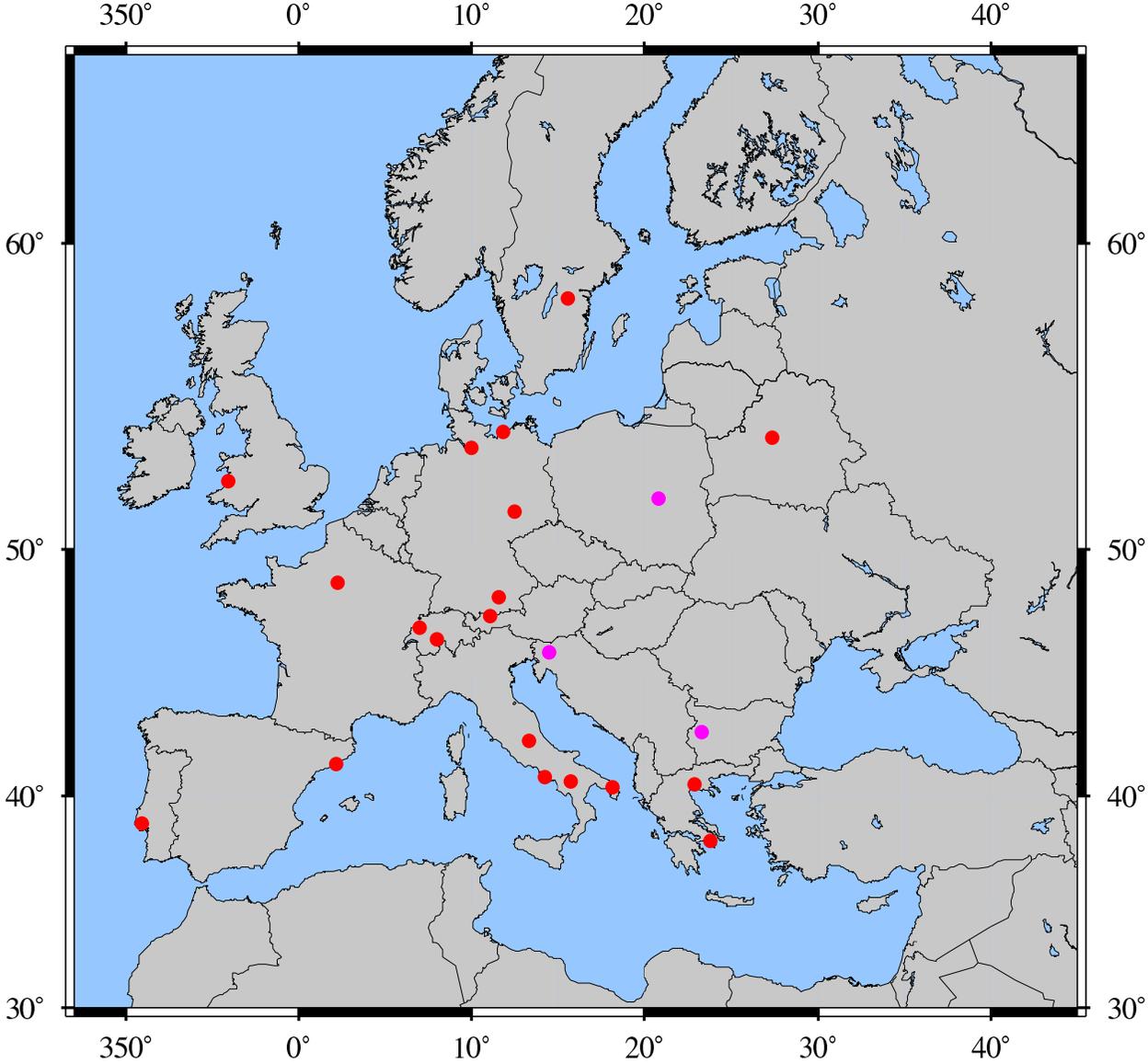
## **What to maintain?**

- **Independent extinction measurements.**
- **Quality assurance system.**
- **Regularly scheduled measurements.**
- **Coordinated observations for dedicated studies.**
- **Central provision of backtrajectories.**
- **Single access point for data.**
  
- **The aerosol lidar community!**

## **What to improve?**

- **Spatial coverage (fill gaps).**
- **Temporal coverage.**
  - **More diurnal cycles.**
  - **Daytime extinction measurements.**
  - **More partially cloudy scenes.**
  - **Weekly cycle.**
  - **Approach continuous measurements.**
- **Homogeneity of evaluation/interpretation (e.g. cloud screening, PBL-height)**
- **Construct user friendly data base.**
- **Cooperation with “the rest” of the aerosol community.**

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## **Towards an Integrated Aerosol Observing System**

**No single method of observation can provide the necessary information!**

**Suggested combination:**

- **Lidar network for the vertical distribution and reliable optical properties.**
- **Network of sun-photometers for wide spatial coverage with integrated properties.**
- **Network of in-situ measurements for full microphysical and chemical characterisation.**
- **Advanced satellite retrievals for global coverage.**
- **Advanced modelling/data assimilation for a synthesis of the sparse observations.**

**AIROS is an Integrated Project designed for this purpose, including AERONET/ PHOTONS, EARLINET, GAW, satellite and modelling communities.**

## **Which structure?**

**EARLINET as an “umbrella” (e.g, EEIG) to cover:**

- **EARLINET as a research training network (EARLI-TRAIN).**
- **EARLINET as key part of AIROS.**
- **EARLINET as partner for smaller contracts.**
- **EARLINET as a large scale facility?**
- **?**

## **Funding?**

- **Base funds of partner institutes.**
- **EC Marie Curie Program: Research Training Network.**
- **EC Marie Curie Program: other instruments.**
- **EC FP6 “Sustainable Development”: Integrated Project AIROS.**
- **EC FP6 “Support for Research Infrastructures”: Integrating Activity.**
- **ESA for studies regarding Atmospheric Dynamics Mission, EARTH-CARE, WALES.**
- **ESA and/or NASA: Ground support for CALIPSO.**
- **National programs.**
- **?**