

JRA 1

Lidar and sun photometer

Improved instruments, integrated observations and combined algorithms

Objectives

- **Improved daytime capabilities of lidar instruments**

with emphasis on easy-to-implement solutions and continuous operation (Task 1).

- **Integrated observation strategies for lidar and sunphotometer**

to make the best use of complementary information on atmospheric aerosols gained from active and passive remote-sensing instruments (Task 2).

- **Advanced information on aerosol microphysics**

from multi-spectral, multi-angle columnar sunphotometer and height-resolved multi-wavelength lidar observations under consideration of polarization information (Task 3).

Task 1

Improvement of lidar daytime capabilities (technical development)

- extinction observations in the UV and visible wavelength range based on narrow-bandwidth, narrow-field-of-view techniques
- review of existing techniques (different methods already demonstrated, e.g., in Leipzig, Hamburg, Lindenberg)
- optical and mechanical design studies
- implementation and test of optimized solutions
- recommendations for the network

Contributors:

CNR IMAA Potenza

IFT Leipzig

MPIMET Hamburg

Cooperation with
NA2, NA5, JRA3

Task 2

Integrated observation strategies for lidar and sunphotometer (experimental)

- combined measurements in 5 European core regions to cover the variety of aerosol types
- optical depth closure studies; extension of lidar profiles towards ground
- separation of PBL and FT contributions
- optimization of integrated measurement strategies
- harmonized datasets for algorithm development

Contributors:

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SPAIN Univ. Granada/Univ. Valladolid

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Cooperation with
NA2, NA5, JRA3

EARLINET stations

3+2 Raman lidars
(aerosol typing,
microphysics,
10 stations)

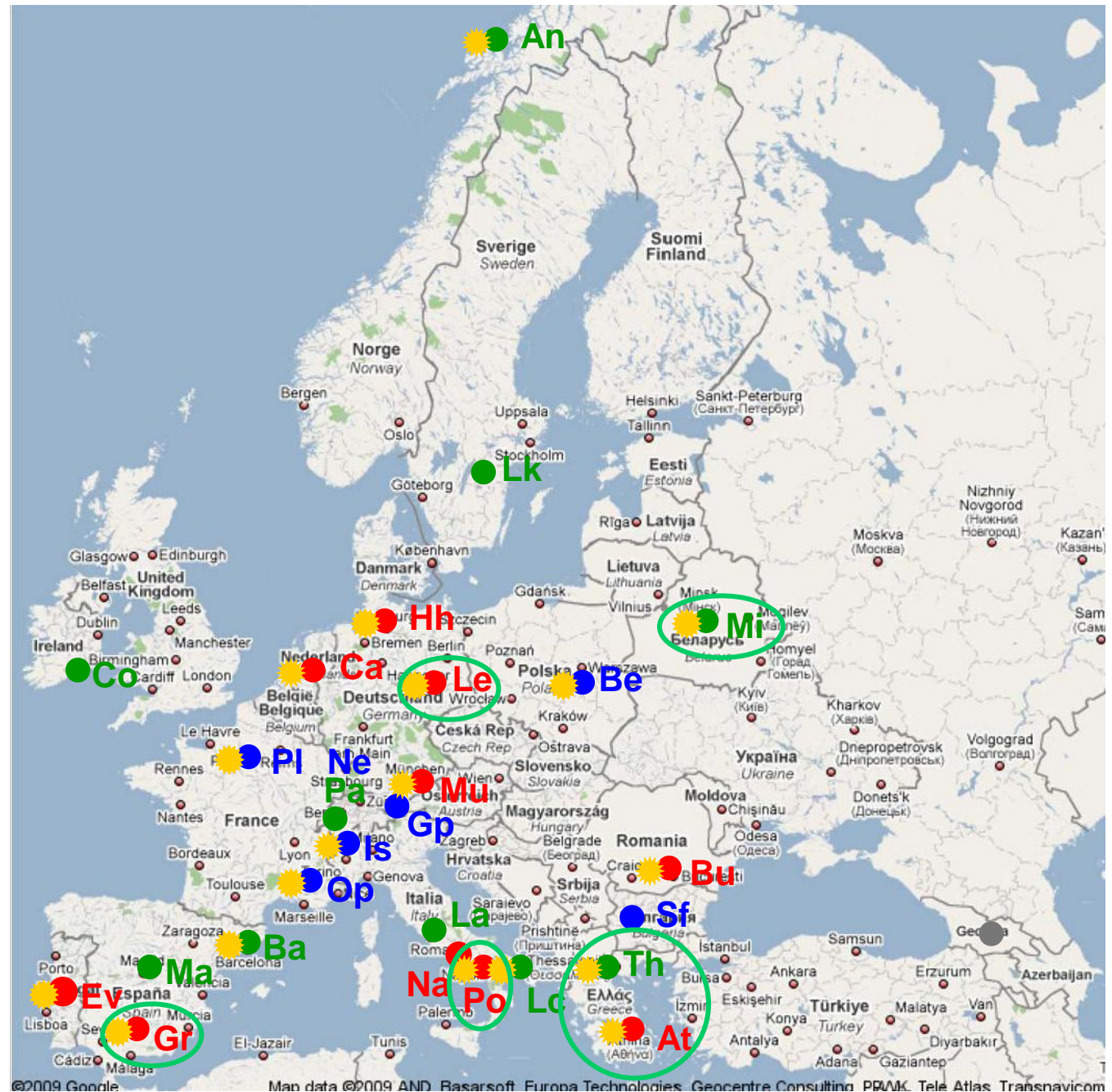
Raman lidars
(extinction profiles,
10 stations)

backscatter lidars

new stations

AERONET stations
(17 stations)

Core stations for
combined
observations and
algorithm
development



Task 3

Integrated retrieval schemes for aerosol microphysical properties (algorithm development)

- improved microphysical retrieval schemes for
size distribution/ effective radius/ volume concentration
refractive index
single-scattering albedo
- algorithm development for sunphotometer + backscatter lidar and
sunphotometer + multiwavelength Raman lidar
- algorithm development for non-spherical particles (dust)

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