Atmospheric observations in Italy (with focus over Rome) in support to the EMERGE-EU summer campaign

Contact persons: Francesca Barnaba and Monica Campanelli (ISAC-CNR)
(f.barnaba@isac.cnr.it, m.campanelli@isac.cnr.it)

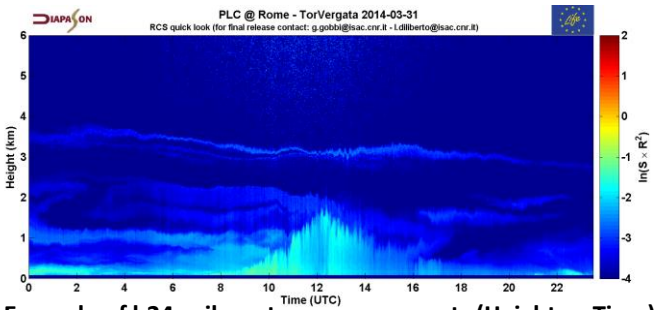
Alicenet (Automated Lidar-Ceilometer network)

Continuous (h24) monitoring of the aerosol vertical distribution at several sites in Italy, some co-located with **AERONET** or **SKYNET** sunphotometers

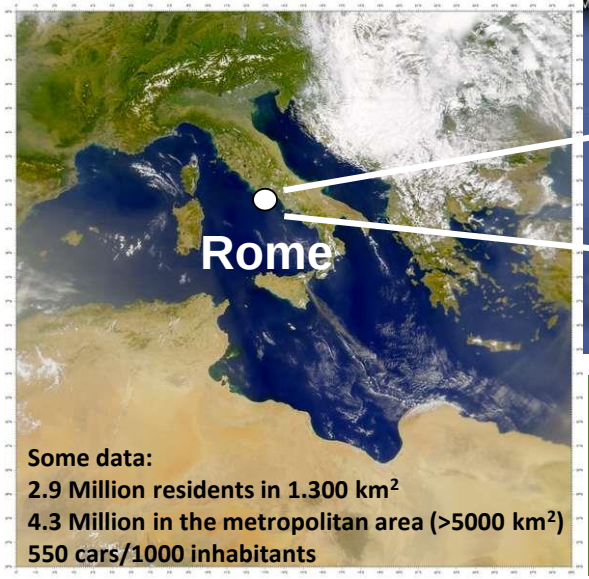
Measurements available in quasi-real time

Site of the Italian Air Force

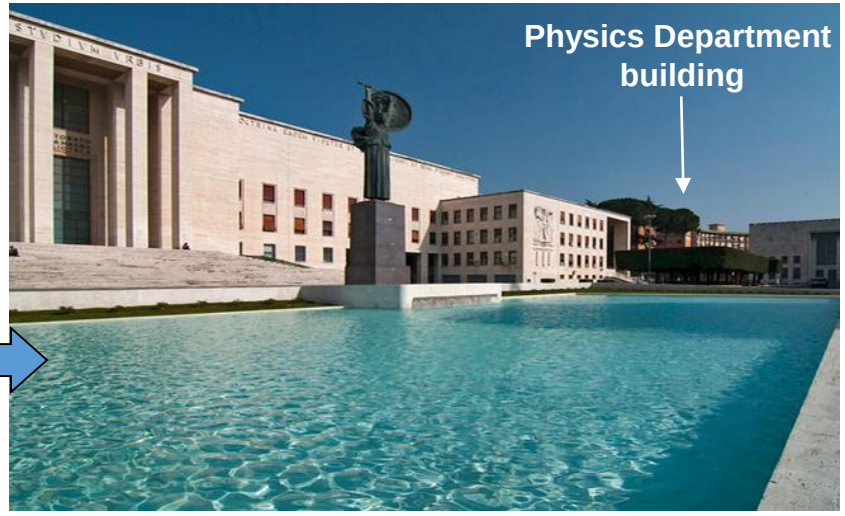
EURO-SKYNET



Example of h24 ceilometer measurements (Height vs Time)



Measurements sites in Rome

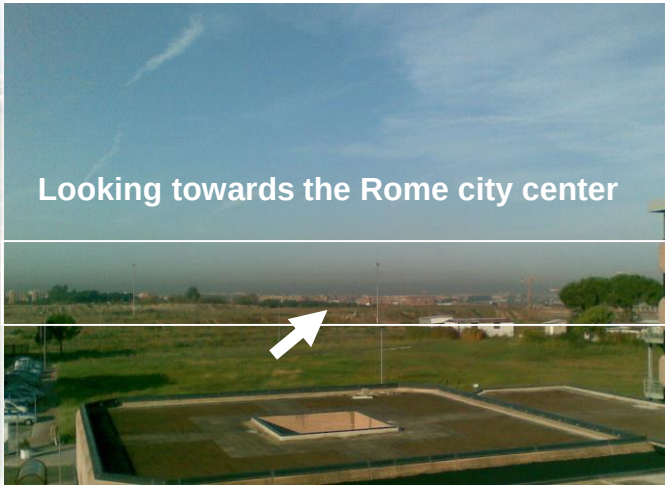


Rome down town

Boundary-layer Air Quality-analysis Using Network of Instruments (BAQUNIN) Supersite, within the Rome University campus

Rome Tor-Vergata

CNR-ISAC Rome Atmospheric Supersite (CIRAS) in the south-eastern outskirts of Rome (Tor Vergata)



Available equipment in the two sites

Rome-Tor Vergata

CIRAS Instruments:

- **CIMEL** photometer (aerosols)
- **PANDORA** Spectrometer (O3, NO_2)
- **SODAR** day/night (wind profiles in PBL)
- **ELASTIC LIDAR/CEILOMETER**, h24 (aerosol profiles)
- **RAMAN LIDAR**, night (H_20)
- **METEO TOWER** (T, P, RH, wind)
- **RADARS** (precipitation)
- **AEROSOL Mobile Lab (AEROLAB)**

Instrumentation operating within Networks

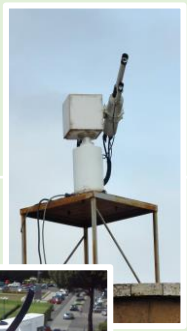
- As part of AERONET (http://aeronet.gsfc.nasa.gov/)
- As part of PANDONIA (http://www.pandonia.net)
- As part of E-PROFILE (http://www.eumetnet.eu/alc-network) & ALICENET (http://www.alice-net.eu)
- As part of NDACC (http://www.ndsc.ncep.noaa.gov)

Rome-down town

BAQUNIN instruments:

- **LIDAR**, Raman and elastic, day/night (aerosols, H_2O, clouds)
- **SODAR** day/night (wind profiles in PBL)
- **MFRSR** radiometer (aerosols)
- **POM 01 L PREDE** sun-sky radiometer (aerosols, H_2O)
- **BREWER** spectrophotometer (O_3, SO_2, NO_2)
- **PANDORA** Spectrometers (O_3, NO_2)
- **CIMEL** photometer (aerosols)
- **YES** broad-band UV radiometer (UV radiation)
- **Meteorological** sensors (air temperature and relative humidity)

- As part of SKYNET (http://www.euroskyrad.net)
- As part of PANDONIA
- As part of AERONET

Instrument - Network	Measured Variable	Time Res	** = available @ both sites
CIMEL CE 318 – AERONET** aeronet.gsfc.nasa.gov	AOD @ 8 wavelengths 340- 1020 nm; Angstrom coefficient Fine & coarse AOD, Volume size dist., Asymmetry factor, Refractive index	15 min 30 min	  
PREDE POM01 – SKYNET** www.euroskyrad.net	AOD @ 7 wavelengths 340- 1020 nm] Angstrom coefficient Volume size dist., Asym. factor, Ref. Ind.	1 min 10 min	
Multi Filter Rotating Shadow-band Radiometer (MFRSR)	AOD @ 4 wavelengths 496-878 nm	1 min	
PANDORA 2S - PANDONIA** www.pandonia.net	Spectrum 270 - 900 nm; resolution 1.1 nm Columnar O3, NO2 *(SO2, HCHO, other)* - Day and Night -	1 min	 
BREWER- EUBREWNET rbcce.aemet.es/eubrewnet	Spectrum 290 – 320 nm & 426 – 453 nm; resolution 0.6 & 0.9 nm Columnar O3, NO2, UV index	30 min	
SODAR**	Vertical profiles of Wind speed and direction in the PBL (0 – 800 m), vertical resolution 1.5 m	< 1 min	
LIDAR-CEILOMETER - ALICENET http://www.alice-net.eu & E-PROFILE http://www.eumetnet.eu/alc-network	Aerosol Vertical Profiles @ 1064 nm, Mixing Layer Height, Fog , Clouds range 0.150 - 15 km vertical resolution 15 m	< 1 min	 
RAMAN LIDARS – NDACC** http://www.ndsc.ncep.noaa.gov	Vertical profile of water vapour mixing ratio (75m-13km), Aerosol (300m-30 km) vertical resolution 75 m	1 min	

Additional in situ instrumentation in the Rome-Tor Vergata CIRAS site (mobile AEROLAB)

NEW!

Instrument	Measured Variable	Time Res
APS	Aerosol number size Distribution (aerodynamic diameter 500-20000 nm)	5 min
SMPS	Aerosol number size Distribution (dm 10-800 nm)	5 min
Nephelometer	Aerosol Scattering Coefficient @ 3 wavelengths	1 min
Aethalometer	Aerosol Absorption Coefficient @ 7 wavelengths	1 min
Gas sensors	NO2, CO, O3, SO2	1 min
OPC	Aerosol (optical) size Distribution 250-20000 nm + derived PM10, PM2.5, PM1	1 min
Meteo & Radiation	Meteo Station + Pyranometer	1 min






Our main scientific interests in line with the EMERGE objectives:

1: Investigate the European continent pollution export to the Mediterranean

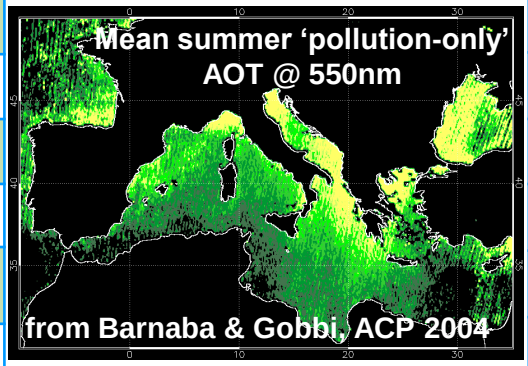
2: Investigate the role of long-range transport in building up the aerosol field over Europe

3: Investigate the relationship between the aerosol characteristics at the ground and their vertically-resolved and total-column properties

4: Explore the link between the aerosol physical/optical properties and their chemical composition, with particular focus on BC and Brown C in urban areas

5: Identification/Characterization of air pollution sources and dispersion

BAQUNIN Staff	
Jonas von Bismarck	ESA ESRIN
Stefano Casadio	SERCO/ESA ESRIN
Anna Maria Iannarelli	SERCO/Univ. Sapienza
Marco Cacciani	Univ. Sapienza
Andrea Scoccione	Univ. Sapienza
Monica Campanelli	CNR - ISAC
Annamaria Siani	Univ. Sapienza
Giampietro Casasanta	CNR - ISAC
Henrì Diemoz	ARPA Valle d'Aosta



CIRAS Staff	
Gian Paolo Gobbi	CNR – ISAC (Aerosol)
Stefania Argentini	CNR – ISAC (Meteorology)
Francesca Barnaba	CNR – ISAC (Aerosol)
Monica Campanelli	CNR - ISAC
Giampietro Casasanta	CNR – ISAC (Meteorology)
Francesca Costabile	CNR – ISAC (Aerosol)
Luca Di Liberto	CNR – ISAC (Aerosol)
Davide Dionisi	CNR – ISAC (Aerosol, H20)
Gian Luigi Liberti	CNR – ISAC (H20)
Igor Petenko	CNR – ISAC (Meteorology)