Potenza GRUAN site (CIAO)

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CIAO ground based facility for Earth Observation

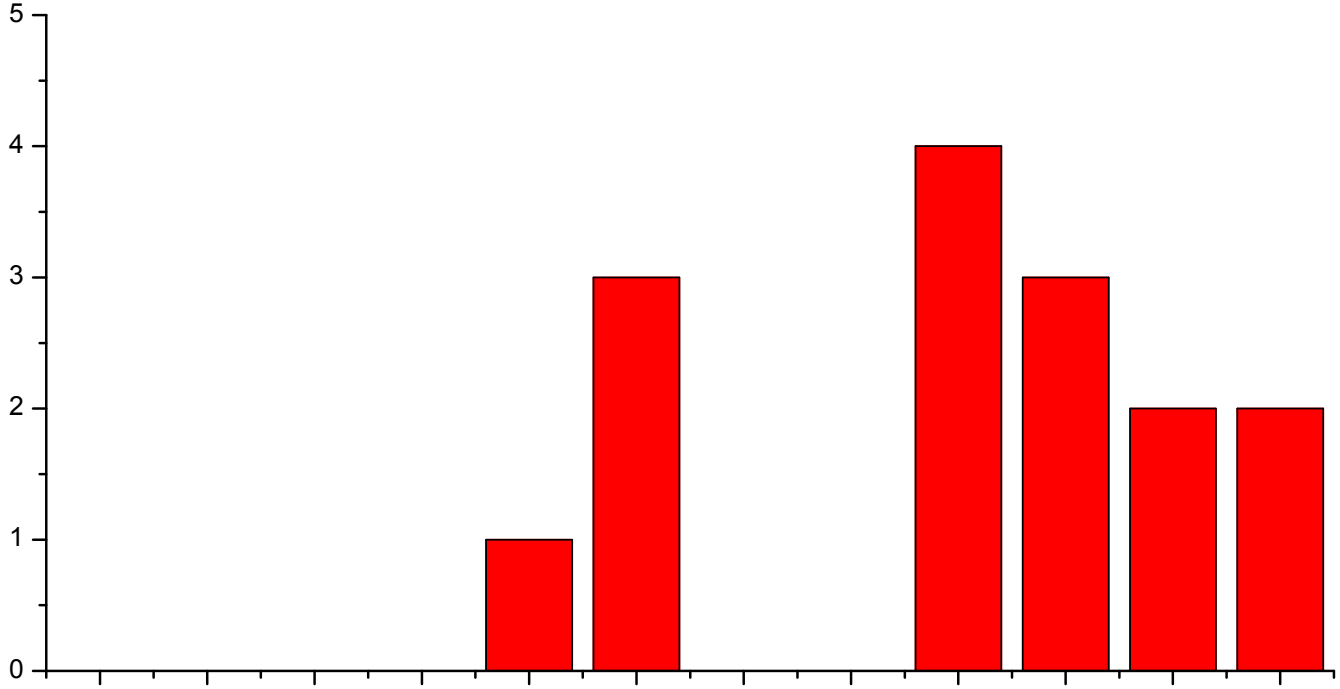
- PEARL muliwavelenght Raman lidar (EARLINET)
- Microwave profiler 12 channels (Radiometrics MP3014) + IR thermometer
- PP15 and MW21 manual radiosounding systems (P,T, RH, O3 and wind) RS92-Vaisala
- Autosonde AS13 (P,T, RH and wind) RS92-Vaisala
- CIMEL sunphotometer (AERONET)
- Cloud-radar (METEK MIRA-36)
- Ceilometer (Jenoptik CHM15k)
- Ceilometer (VAISALA CT25K)
- Automatic surface radiation station (2Pyranometers, 1pyrgeometer, 1perieliometer Kipp&Zonen)
- GPS receiver (Trimble)
- MUSA (Multiwavelenght System for aerosol) lidar – Intercomparison reference system for EARLINET/CEOS/NASA/ESA

Madonna et al. "CIAO: the CNR-IMAA advanced observatory for atmospheric research", Atmos. Meas. Tech. (2011)

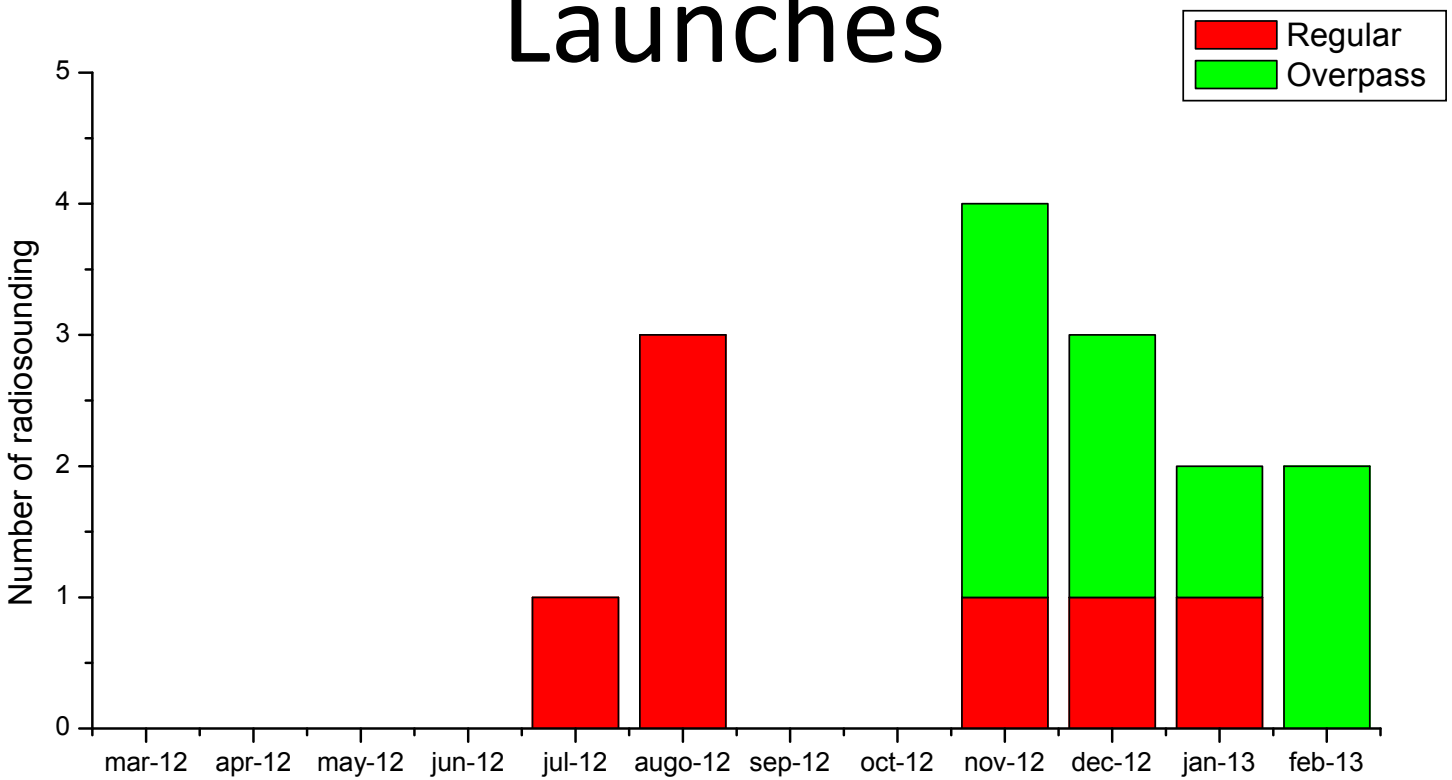
GRUAN measurements

- Once per week excluding problems or rain
- Overpass at 01:00 (autolauncher)
- No stratospheric water vapor measurements
- Ideas for an external GC like Temperature-Humidity reference system (THref) to be designed with INRIM (Merlone)

Launches



Launches

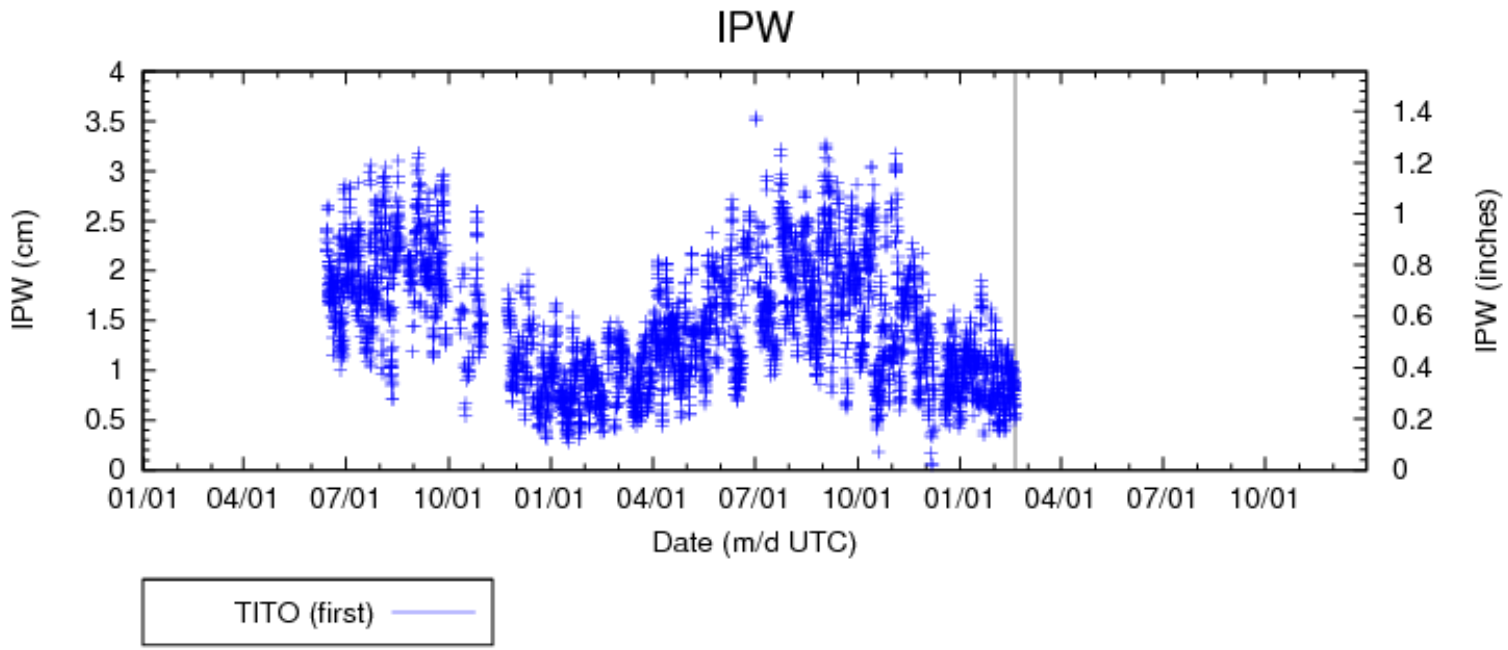


Potenza (16300) **40.60, 15.72** **(18Z, 00Z)**

	Decending		AscendIng	
Sat	Range	Nadir	Range	Nadir
NPP	0005-0140 Z	**0050 Z**	1100-1235 Z	1150 Z
Aqua	0015-0150 Z	**0100 Z**	1120-1245 Z	1205 Z
MetOp-A	0810-0945 Z	0855 Z	1910-2040 Z	1955 Z

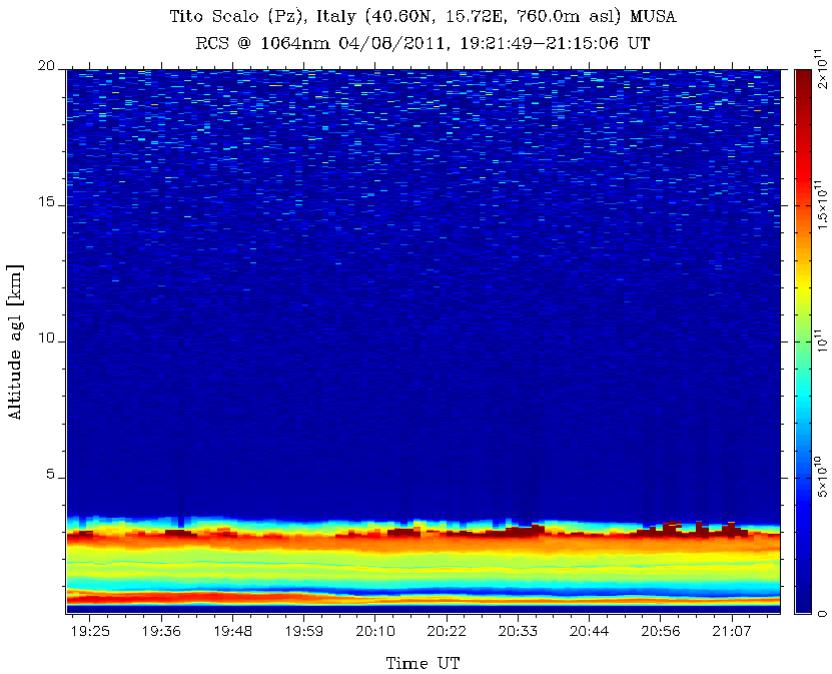
GRUAN measurements

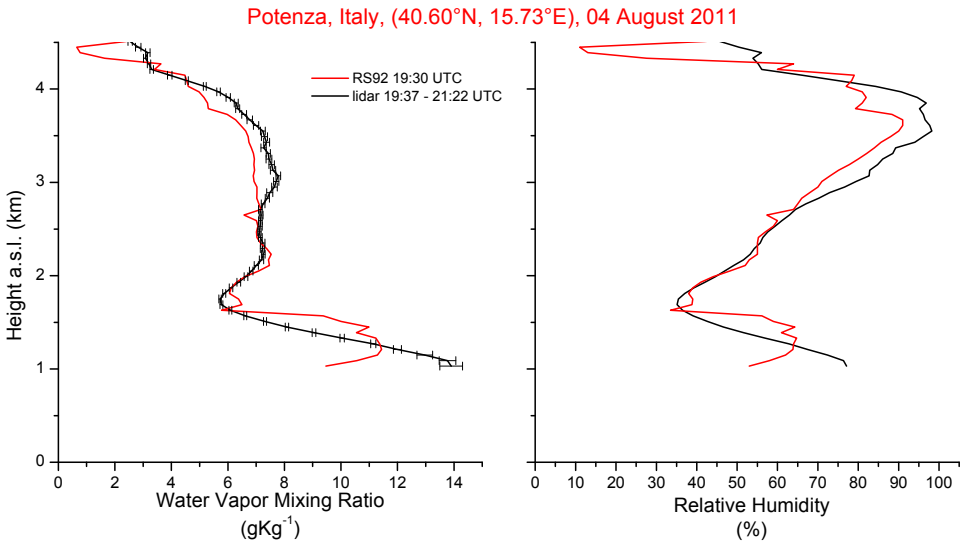
Data available at:
RING: http://ring.gm.ingv.it/station.php?stazione=TITO
NOAA GPS-Met: http://gpsmet.noaa.gov/
Type: Passive
Category: GPS
Construction: Trimble
Installation: 2009-01 (permanent station)
Current state: data processed for IPW since 11 June 2011



GRUAN measurements

Water vapor Raman Lidar: all the time series in correspondence of GRUAN RS of 2011 and 2012 are analyzed (including different time resolution)





GRUAN measurements

- MWP: Radiometrics (24 h/7days)
- Ceilometer: Jenoptik (1064 nm) + CT25k (905 nm) 24 h/7days
- Aerosol: EARLINET and AERONET (lidar and Sun photometer)
- BSRN: not operational, but hopefully within 31 March 2013
- Radar: 24 h/7days (on maintenance since 12 Dec. 2012)

New funds and systems

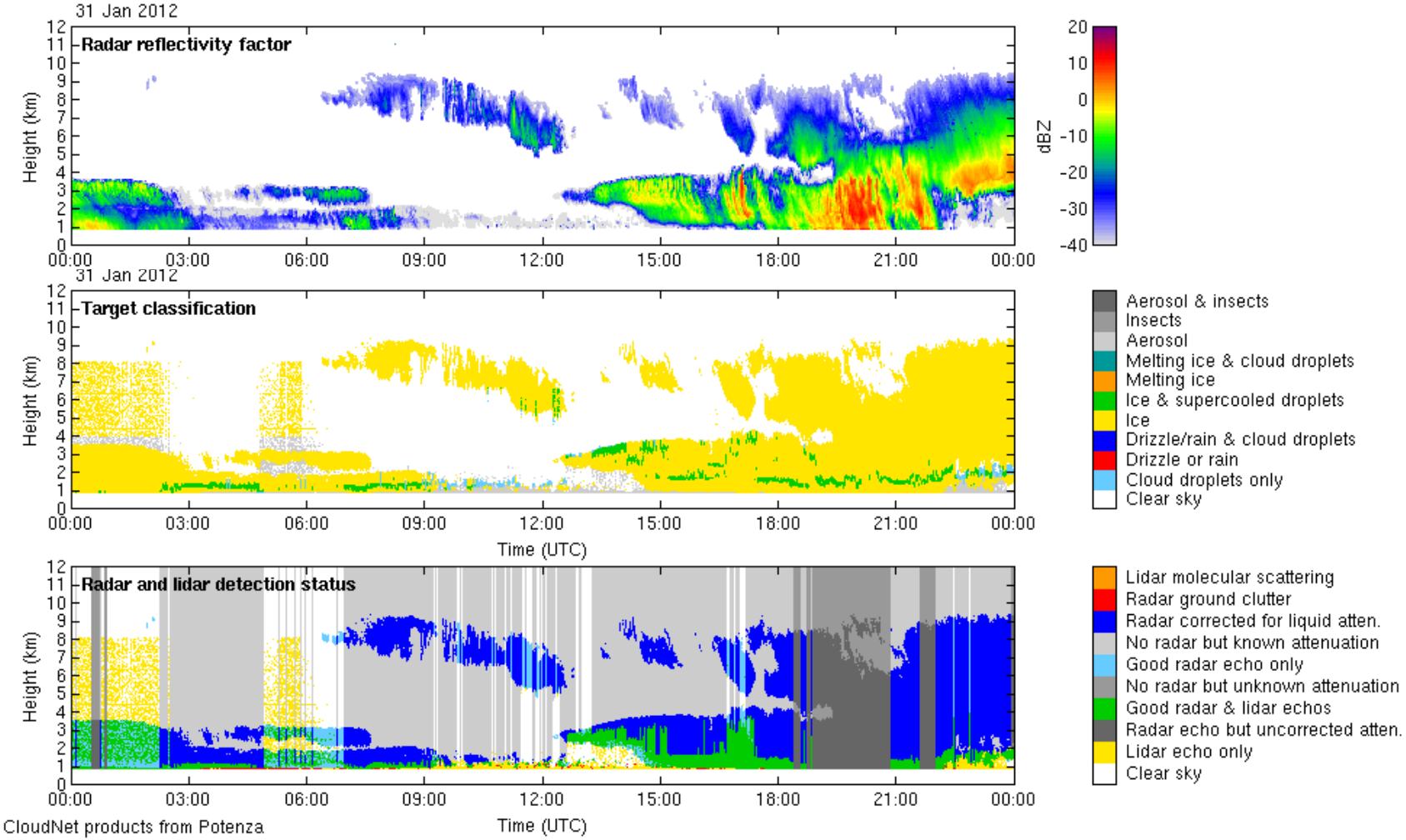
- Funds secured to perform one/two RS per week for at least two years from now.

Operational by Aug. 2013:

- Leosphere Lidar Super Ceilometer R-MAN510 (355,387+depol)
- Raman Depolarization Lidar Raymetrics 3D scanning LR111-UV-D200 (including water vapor)
- PREDE sun and sky photometer (340 to 2200 nm)
- DUSTTRAK II aerosol monitor: aerosol concentrations corresponding to PM_1, $PM_{2.5}$, respirable, or PM_{10} size fractions

Future by 2015 (hopefully!): RRL for temperature and aerosol

ACTRIS: Cloudnet processing



CloudNet products from Potenza

Modelling evaluation

Output from the main European mesoscale weather models:

Met Office mesoscale

Met Office NAE

Met Office global

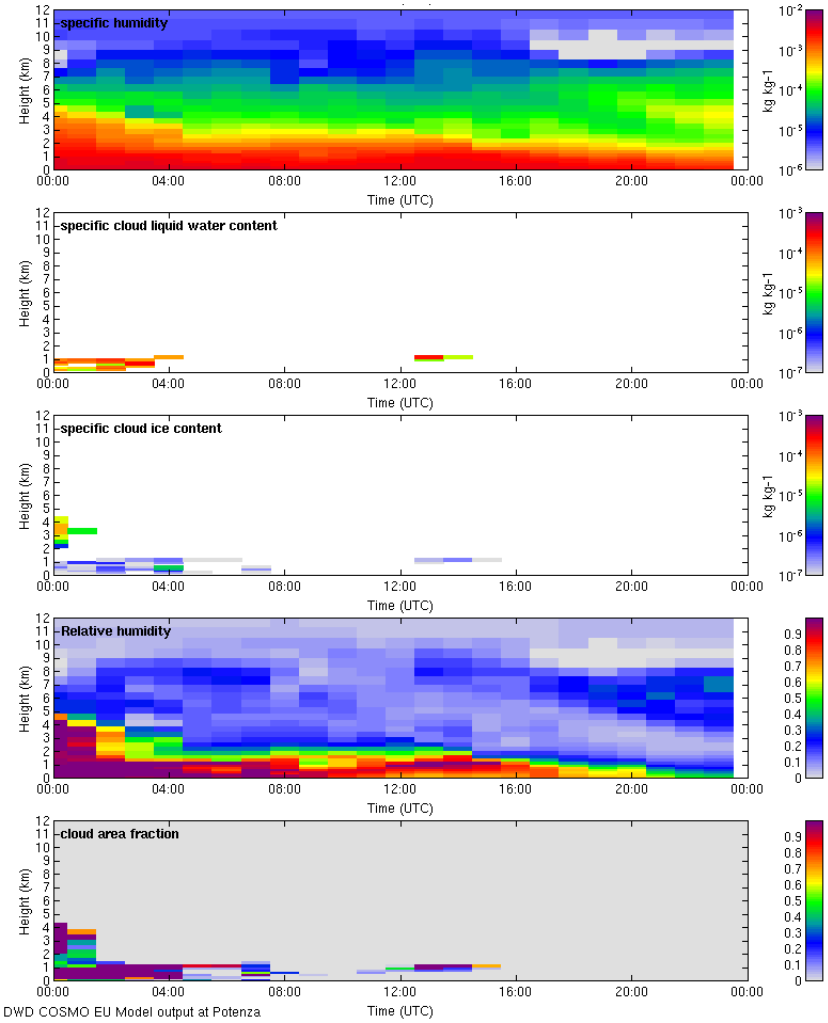
ECMWF

Meteo France model

RACMO

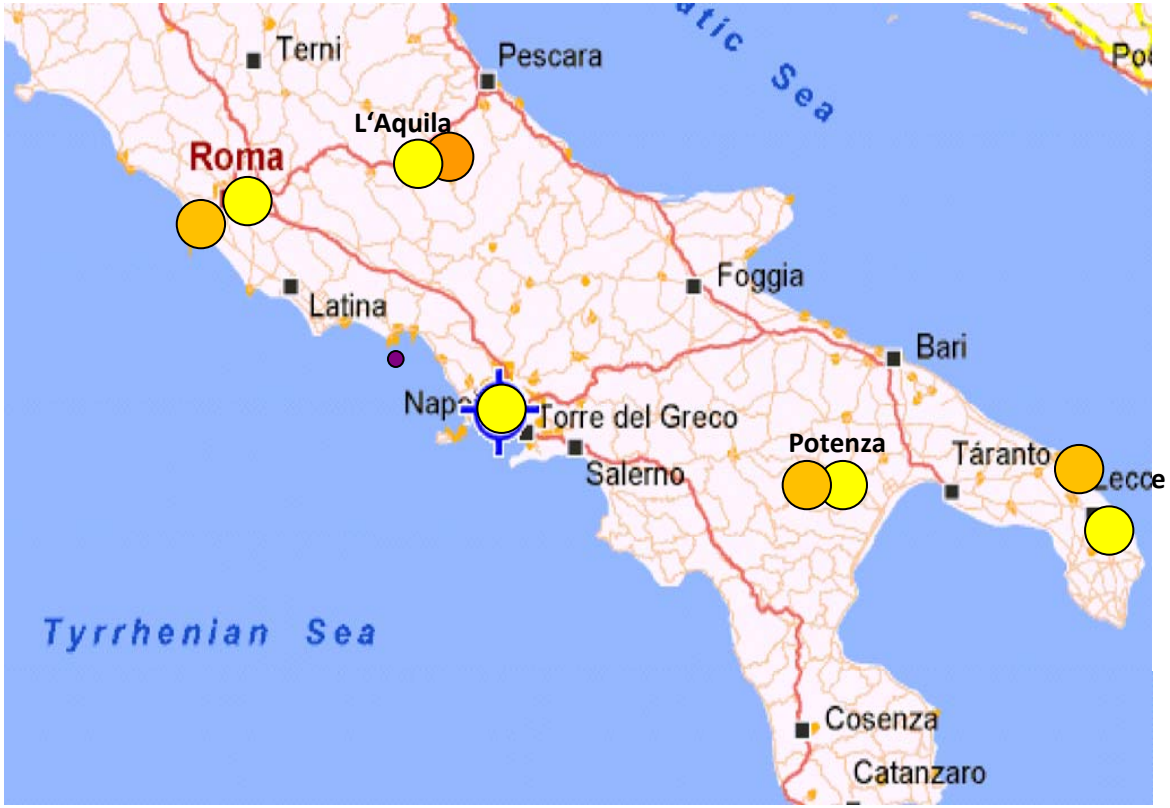
SMHI RCA

DWD Lokal Modell output



Proposal to Italian Space Agency

"Proposal for the establishment of a database of water vapor Raman lidar measurements for satellite validation"

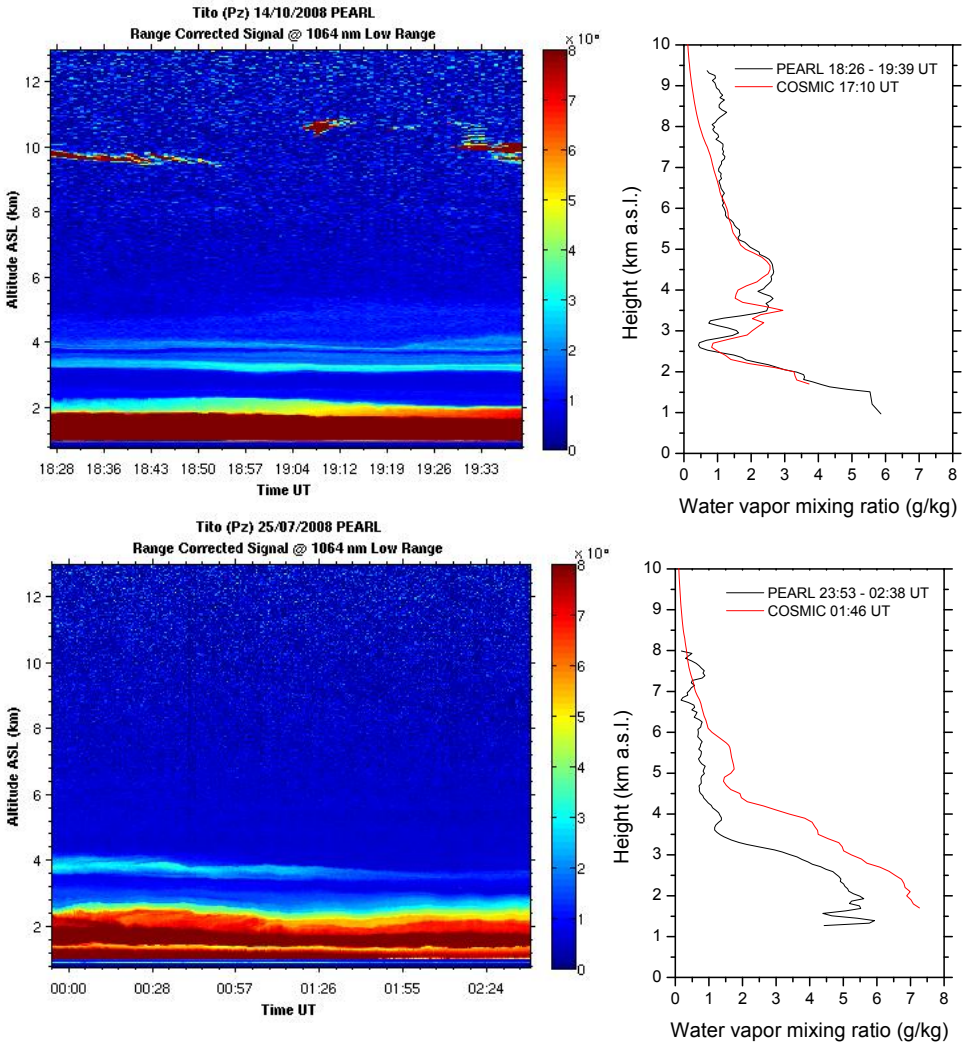


- Raman Lidar
- RS station (RAOB and no RAOB stations)

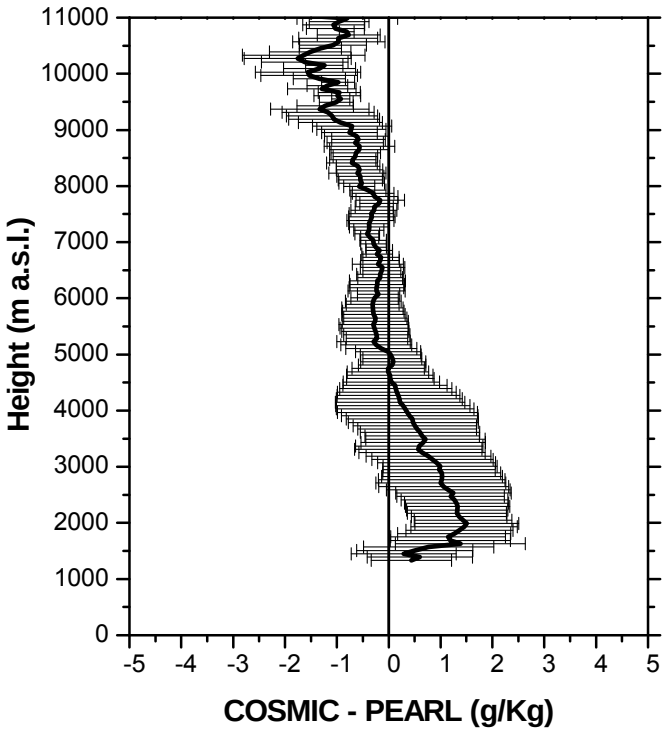
Stations involved

- **Potenza**
- **L'Aquila**
- **Naples**
- **Rome**
- **Lecce**

Satellite validation: COSMIC



Madonna et al., 2011, SPIE



…. also ROSA mission will be investigated

Other activities

PRIN proposal: "**Statistical models for spatial and spatio-temporal data: methods and applications**".

Work package: "**Climatology**"

GOALS

The main aim is to contribute with advanced statistical tools to the construction of the GRUAN (Global Reference Upper Air Network) network which aims to obtain reference long-term measurements of the global climate in the upper troposphere-lower stratosphere.

EXPECTED RESULTS

Systematic modeling of vertical profiles allows a unified approach to climatic global quantities.

Possibilities for the study of co-location and network design requirements over global scale

www.ciao.imaa.cnr.it

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CIAO: the CNR-IMAA atmospheric observatory

The CNR-IMAA Atmospheric Observatory (CIAO) is located in Tito Scalo, 6 km far from Potenza, Southern Italy, on the Apennine mountains (40.60N, 15.72E, 760 m a.s.l.) and less than 150 km from the West, South and East coasts. The site is in a plain surrounded by low mountains (<1100 m a.s.l.). The observatory operates in a typical mountain weather strongly influenced by Mediterranean atmospheric circulation, resulting in generally dry, hot summers and cold winters. In this location phenomena like orographically-induced effects on cloud formation can be studied. The site is representative of the Mediterranean area and is affected by a large number of Saharan dust intrusions each year.

CIAO represents a well-established ground-based remote-sensing observatory for the study of weather and climate. The observatory consists of a combination of advanced systems able to provide high quality long-term observations of aerosol and cloud properties. Since 2000, systematic observations of aerosol, water vapour and clouds have been collected and the acquisition of new active and passive microwave profilers has strengthened the equipment required for performing accurate

NEWS

Applications for 4 Experienced Researcher (ER, 2-year) positions in ITARS. (Deadline: 28 February 2013)

XXVI International Laser Radar Conference (ILRC26)

9th International Symposium on Tropospheric Profiling (ISTP)

ACTRIS call for TNA proposals is now open!