

TITLE

OTHER_Italy_Mt.Cimone_20090101_20091231.sfc

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1. 0 DATASET OVERVIEW

1.1 Introduction

Mt. Cimone is the highest peak of the Italian Northern Apennines and is characterized by a 360° free horizon. On the Mt. Cimone Mountain top there is the ISAC-CNR Italian Climate Observatory “O. Vittori” (ICO-OV), included in several international environmental programme (GAW-WMO, EUSAAR, SHARE) and equipped with different sensors that not only permit to record the standard meteorological parameters but also permit to carried out long-term monitoring activity on atmospheric composition, providing useful information to better understand the role of regional and long-range transport processes in modifying the tropospheric background conditions in the Mediterranean basin/Southern Europe (Balkanski et al., 2003; Bonasoni et al., 2000; Bonasoni et al., 2004; Cristofanelli, 2007; Marinoni et al., 2008). The ICO-OV is hosted by the Meteorological Observatory of the Italian Air Force – Meteorological Service (Camm Mt. Cimone)

Intensive meteorological observation observations in this mountain area show that the annual mean temperature is about 2°C, the winter one is about -4°C (minimum of about -22°C) and a summer mean of about 10°C (maximum high at about 18°C).

The peak is usually snow-covered from November to late May and during the year prevailing winds blow from SW and NE.

1.2 Time period covered by the data

Start: January 1, 2009, 00:15

End: December 31, 2009, 23:45

1.3 Temporal characteristics of the data

All parameters are reported as 30 minute average values centred at 15 and 45 minutes. Hour is UTC.

1.4 Physical location of the measurement

Latitude: 44° 12' N

Longitude: 10° 42' E

Elevation: 2165 m a.s.l.

1.5 Data source

Original data provided by the ISAC-CNR.

1.6 WWW address references

<http://isac.cnr.it/cimone>

<http://www.ev2cnr.org>

2.0 INSTRUMENTATION DESCRIPTION

2.1 Platform

The *Rotronic* and *Tecnoel* sensors are mounted within a standard weather station, while *IRDAM* sensor are mounted on 6-m masts and *Skye* sensors are mounted at the top of observatory roof (4-m agl).

2.2 Description of the instrumentation

Parameter	Model	Manufacturer
Air Temperature	MP101A-T4-W4W	Rotronic
Air Temperature	WST7000	IRDAM
Relative Humidity	MP101A-T4-W4W	Rotronic
Relative Humidity	WST7000	IRDAM
Station Pressure	TE-PR-07Y_A_B_HHJ	Tecnoel
Station Pressure	WST7000	IRDAM
Wind Speed	WS425	Vaisala
Wind Speed	WST7000	IRDAM
Wind Direction	WS425	Vaisala
Wind Direction	WST7000	IRDAM
Solar Radiation	SKU 110	Skye
UVB radiation	SKU 430	Skye

2.3 Instrumentation specification

Parameter	Sensor Type	Height of sensor (m)	Accuracy	Resolution
Air Temperature (Rotronic)	platinum RTD	1	± 0.3 °C at 23°C	0.1°C
Air Temperature (Irdam)	platinum RTD	6	± 1 °C	0.1°C
Relative Humidity (Rotronic)	Thin-film polymer capacitor	1	± 1.5 % RH at 23°C	0.1 %
Relative Humidity (IRDAM)	Thin-film polymer capacitor	6	± 3 % RH at 20% to 90% ± 4 % RH at 0% to 20% and >90%	0.1 %
Station Pressure (Tecnoel)	Pieso-resistance	1	± 0.2 % from 660 hPa from 860 hPa	0.1hPa
Station Pressure (Irdam)	Pieso-resistance	6	± 1 hPa at 20°C; ± 3 hPa from -40°C to 60°C;	0.1 hPa
Wind Speed (Vaisala)	Ultrasonic anemometer	4	± 0.135 m/s	0.1 m/s
Wind Speed (Irdam)	Thermal Field Variation (TFV)	6	$\pm(5\%+0.5$ m/s)	1 m/s
Wind Direction (Vaisala)	Ultrasonic anemometer	4	± 2 °	1°
Wind Direction (Irdam)	Thermal Field Variation (TFV)	6	± 5 °	1°
Solar Radiation (Skye)	Silicon photocell	4	Uncertainty ± 5 % based on an estimated confidence of not less than 95%	0.01 W/m ²
UVB radiation (Skye)	Semi-conductor photocell	4	Better than 2%	0.01 W/m ²

3.0 DATA COLLECTION AND PROCESSING

3.1 Description of data collection

Raw data are acquired on a 1-minute basis and then averaged over 30-minute periods. Data submitted to CEOP are those provided by the *Rotronic* sensor (for air-temperature and atmospheric pressure) and by the *Irdam* sensor (for relative humidity). Wind intensity and direction submitted to CEOP are those recorded by the *Irdam* sensor (TFV).

Due to technical problems, no data are available for the *Vaisala* sensor during year 2009. Solar and UVB radiation data are still under evaluation and will be submitted to CEOP as soon as available

3.2 Description of derived parameters and processing techniques used

Temperature, relative humidity, atmospheric pressure and wind speed are 30-minute averaged values (based on 1-minute validated data) centred at 15 and 45 minutes. Wind direction is the prevalent wind direction calculated by analysing the frequency distribution within each 30-minute interval

The three parameters indicated below were computed by using “CEOP Derived Parameter Equations” available at: http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html. These data have the flag “I”. In the case of calculated by using dubious value flagged “D”, the data flag was put D”.

Dew Point Temperature was computed by using (Bolton 1980):

$$es = 6.112 * \exp((17.67 * T)/(T + 243.5));$$
$$e = es * (RH/100.0);$$
$$Td = \log(e/6.112)*243.5/(17.67-\log(e/6.112));$$

where:

T = temperature in deg C;
es = saturation vapor pressure in mb;
e = vapor pressure in mb;
RH = Relative Humidity in percent;
Td = dew point in deg C

Specific Humidity was computed by using (Bolton 1980):

$$e = 6.112 * \exp((17.67 * Td)/(Td + 243.5));$$
$$q = (0.622 * e)/(p - (0.378 * e));$$

where:

e = vapor pressure in mb;
Td = dew point in deg C;
p = surface pressure in mb;
q = specific humidity in kg/kg.

U,V Components were computed by using (GEMPAK):

$$U = -\sin(\text{direction}) * \text{wind_speed};$$
$$V = -\cos(\text{direction}) * \text{wind_speed};$$

4.0 QUALITY CONTROL PROCEDURES

For all parameters, the data has been visually checked, looking for extremely and unusual low/high values and/or periods with constant values or anomalous variability. If available, for each parameters behaviours from the different sensor were compared for consistency. The quality control flags here presented follow the CEOP data flag definition document.

5.0 GAP FILLING PROCEDURES

No gap filling procedure was applied.

6.0 DATA REMARKS

6.1 PI's assessment of the data

None.

6.1.1 Instruments problems

None.

6.1.2 Quality issues

None.

6.2 Missing data periods

All data are missing on January 13, 2009 at 18:15, from June 21, 2009 at 6:15 to June 22, 2009 at 9:15 and on August 21, 2009 from 8:45 to 14:15 (except temperature and station pressure data).

Moreover:

- during the year, wind speed and direction data are missing for more or less extended periods (particularly during November);
- air temperature data are missing on August 8, 2009 at 8:45;
- air temperature, relative humidity and atmospheric pressure are missing on June 16, 2009 from 14:15 to 15:15;
- relative humidity data are missing from April 16, 2009 at 08:15 to April 22, 2009 at 13:45 and from November 28, 2009 at 4:45 to December 6, 2009 at 00:15.

7.0 REFERENCE REQUIREMENTS

Original data was collected by ISAC-CNR within the framework of the SHARE project funded by Ev-K2-CNR.

8.0 REFERENCES

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