



## **Long-term surface ozone variability at the Mt. Cimone WMO/GAW Global Station (2165 m a.s.l., Italy)**

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While several studies have been analysed the long-term surface ozone variability and trends at remote and rural locations of continental Europe, such an analysis is still lacking for the Mediterranean basin. For this reason, here we analysed the surface ozone variability observed at the Mt. Cimone WMO/GAW global station (CMN, 44° 12' N, 10° 42' E, 2165 m a.s.l., Italy) from 1991 to 2011. The measurements performed at this high-mountain observatory represent the longest surface ozone record at a baseline site in the Mediterranean basin.

The shape of the mean annual variation of ozone (a winter minimum and a spring - summer maxima) is well comparable with that observed at other 4 baseline sites in the Alps and in the Mediterranean region (Jungfraujoch – Swiss Alps, Sonnblick – Austrian Alps, Mt. Kravavec – Slovenia and Giordan Lighthouse – Island of Malta). In general, CMN shows higher ozone during warm months, which is likely to be related with vertical transport of polluted air-masses at regional and continental scales.

In agreement with other baseline measurements in Europe, the first part of the CMN measurement period (1991-1993) was characterised by lower mean monthly mixing ratios, compared to the subsequent part of the time series. Constant ozone mixing ratios were generally observed at CMN from 1998 to middle 2004, while larger positive ozone anomalies were observed for the years 2005 – 2008. In agreement with other Alpine and Mediterranean baseline sites lower ozone values were finally observed at CMN during the most recent years (i.e. from 2009 to 2011). This resulted in the appearance of a significant positive linear trends in the monthly O<sub>3</sub> mixing ratios over the period 1991 - 2011. On a seasonal basis, a positive trend has been observed for 1996 – 2011 only for spring. Significant decreases of the seasonal ozone growth-rates have been detected at CMN from winter to spring (during 1991 – 2011) and for summer during 1996 – 2011.