Supplement of

Organic aerosol evolution and transport observed at Mt. Cimone (2165 m a.s.l.), Italy, during the PEGASOS campaign

M. Rinaldi et al.

Correspondence to: M. Rinaldi (m.rinaldi@isac.cnr.it)

The copyright of individual parts of the supplement might differ from the CC-BY 3.0 licence.
Organic aerosol evolution and transport observed at Mt. Cimone (2165 m asl), Italy, during the PEGASOS campaign

Supporting information

Figure S1. AMS sulphate (after CE correction) vs. offline PM1 sulphate. R = Pearson’s correlation coefficient, a = intercept, b = slope.
Figure S2. Meteorological parameter measured during the campaign. T = air temperature, P = atmospheric pressure, RH = relative humidity, WS = wind speed, WD = wind direction, UVB = UV-B radiation flux.

Figure S3. Time trends of AMS organics (green) and SH (black).

Figure S4. Average daily trend of SH measured at Mt. Cimone. Colored bars indicate the reference periods for the definition of RL, TR and PBL samples.

PMF analysis

Figure S5 shows Positive Matrix Factorization (PMF) key diagnostic plots for the HR-TOF-AMS measurements performed at Mt. Cimone during the campaign (June-July 2012). Q/Qexp is shown as a function of the number of factors P (Figure S5, panel a) and fpeak values (Figure S5, panel c). Panel b) and d) show the distribution of scaled residuals and Q/Qexp for each m/z, respectively. For this dataset we chose a 4-factor solution (P= 4) yielding four different OOAs, with Q/Qexp = 2.3. Two of the OOAs (Factor 1 and Factor 4 in Figure S6) were recombined into one factor, because of coincident time series and profiles, yielding the factor labelled OOAa in the paper. This solution was chosen
instead of the 3-factor solution (P=3) because it reduced Q/Qexp and residuals. The addition of a
factor (P=5) does not further decrease significantly the Q/Qexp (2.2), meaning that most of the data
variability can be explained by the selected solution. The rotational ambiguity of the 4-factor solution
was explored by varying fpeak between -1.0 and +1.0. Since we did not observe significant changes
in Q/Qexp with fpeak (panel c) and both the mass spectra (MS) and temporal series (TS) did not
change with varying fpeak (not shown here), a fpeak = 0 was chosen for this solution.

Figure S5. Summary of PMF key diagnostic plots (panels a, b, c, d) for the HR-TOFAMS data
collected during the campaign. Panel a) shows the Q/Qexp as a function of the number of factors P
and panel c) shows the Q/Qexp as a function of fpeak for the 4-factor solution. Panels b) and d) show
the distribution of scaled residuals and Q/Qexp as a function of m/z.

Figure S6. Comparison of time series and profile between the factors resulting from the P=4 solution.
The plot shows high similarity for both time series and profile between Factor 1 and Factor 4.
Figure S7. Average daily trend of ozone and OOAc at Mt. Cimone during the campaign.