Supplement of Atmos. Chem. Phys., 18, 5371–5389, 2018
https://doi.org/10.5194/acp-18-5371-2018-supplement

Atmospheric Chemistry and Physics
Open Access
EGU

Supplement of

Vertical distribution of aerosol optical properties in the Po Valley during the 2012 summer campaigns

Silvia Bucci et al.

Correspondence to: Federico Fierli (f.fierli@isac.cnr.it) and Silvia Bucci (s.bucci@isac.cnr.it)

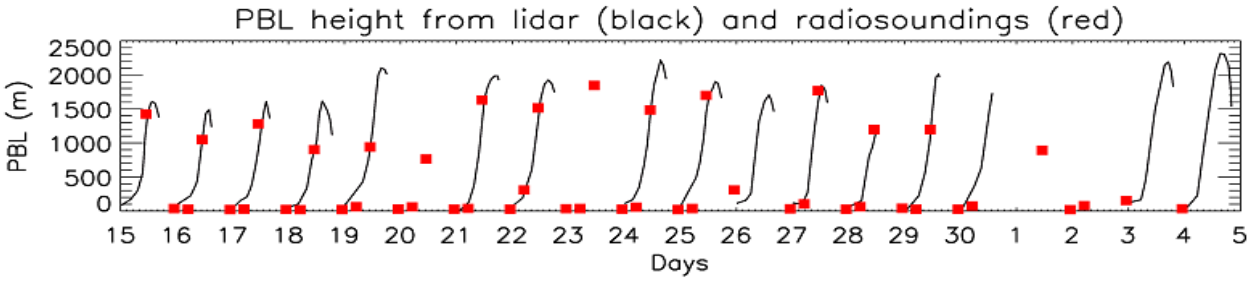

Figure S1. PBL height as inferred by the maximum vertical gradient of R (black line) and PBL height as inferred by the radiosounding data (red dots). Figure is also reported in Sandrini et al. (2016), supplementary material

PBL height from LiDAR shown in Fig. S1 is estimated by visual identification of the maximum gradient of R along the vertical and supported by radiosoundings PBL top evaluation, based on a Richardson number critical threshold of 0.25 (Sorensen et al., 1998; Seibert et al., 2000). During afternoon hours it becomes difficult to univocally identify a sharp gradient in R, as the suspension of aerosol in the forming residual layer masks the contours of the PBL descent. Similar limitations are encountered in the presence of layers of high scattering aerosol, such as during dust events, or in presence of clouds and fog. During this campaign, when such conditions occur, the PBL height from lidar has not been evaluated.

References

Sandrini, S., van Pinxteren, D., Giulianelli, L., Herrmann, H., Poulain, L., Facchini, M. C., Gilardoni, Rinaldi, M., Paglione, M., Turpin, B. J., Pollini, F., Bucci, S., Zanca, N., and Decesari, S.: Size-resolved aerosol composition at an urban and a rural site in the Po Valley in summertime: implications for secondary aerosol formation, Atmos. Chem. Phys., 16, 10879-10897, https://doi.org/10.5194/acp-16-10879-2016, 2016.

Seibert, P.,Beyrich, F.,Gryning, S.E.,Joffre, S.,Rasmussen, S., and Tercier, P.: Review and of Operational Methods for the Determination of the Mixing Height. Atmospheric Environment 34(7):1001-1027, 2000.

Sorensen, J.H., Rasmussen, A., Ellermann, T. and Lyck, E.: Mesoscale on Long-range Transport From ETEX Modeling and Observations, Atmos. Envir., 32(24): 4207-4217, 1998.