

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

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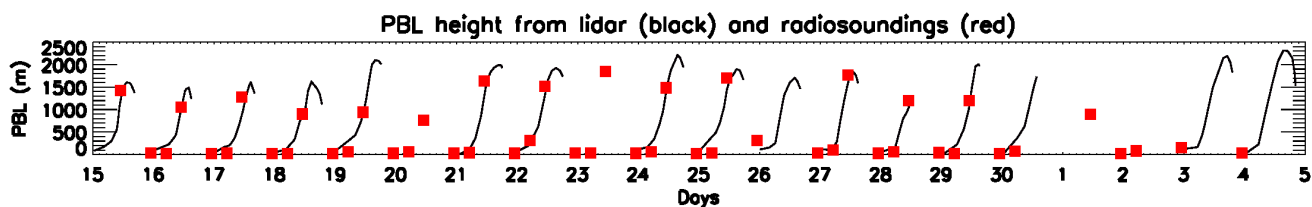


Figure S1. PBL height as inferred by the maximum vertical gradient of R (black line) and PBL height as inferred by the radiosounding data (red dots). Figure is also reported in Sandrini et al. (2016), Supplementary material

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.

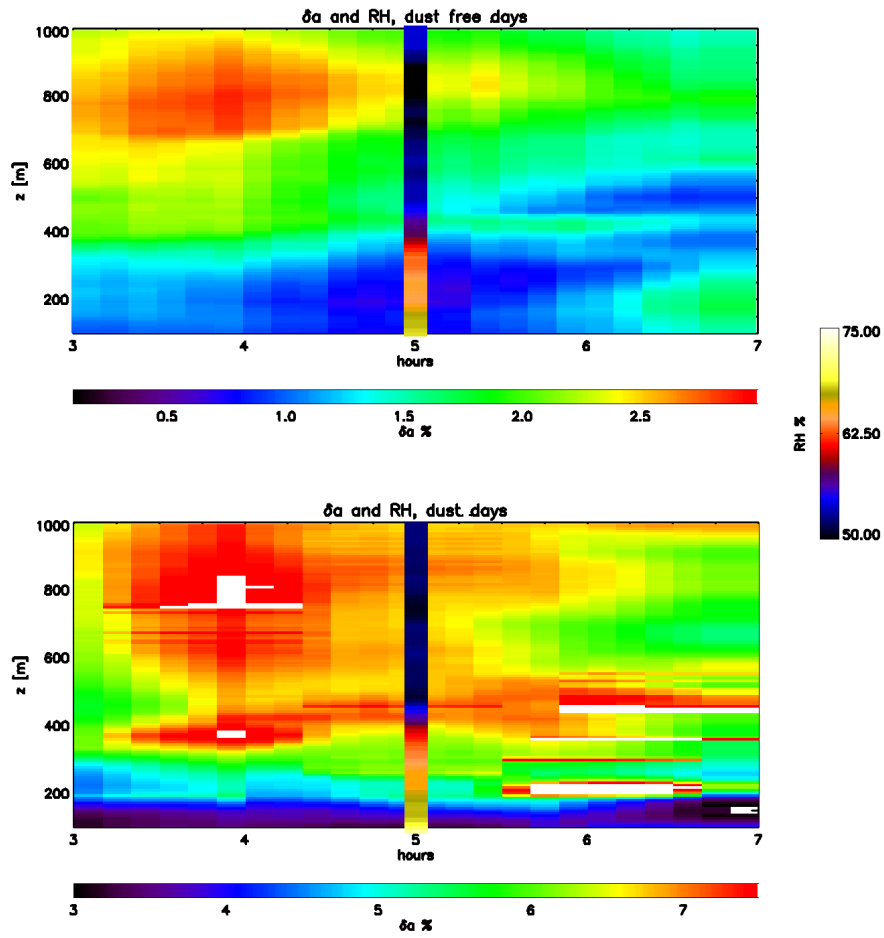


Figure S2.As in Fig. 11, but averaged on dust days (20–23 June and 29 June – 2 July, lower panel) and in dust free days (upper panel)

References

- Sandrini, S., van Pinxteren, D., Giulianelli, L., Herrmann, H., Poulain, L., Facchini, M. C., Gilardoni, S., Rinaldi, M., Paglione, M., Turpin, B. J., Pollini, F., 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. Discuss.*, doi:10.5194/acp-2015-1036, in press, 2016.
- 5 Seibert P., Beyrich, F., Gryning, S.E., Joffre, S., Rasmussen, S., and Tercier, P.: Review and Intercomparison 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 Influence on Long-range Transport Evidence From ETEX Modeling and Observations, *Atmos. Envir.*, 32(24): 4207-4217, 1998