

## ***Interactive comment on “Long term trends in aerosol optical characteristics in the Po Valley (IT)” by J. P. Putaud et al.***

### **Anonymous Referee #1**

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#### General comments:

The manuscript by Putaud et al. presents important results and conclusions drawn from nearly 10 yearlong continuous aerosol records measured at Ispra. Such kind of controlled high quality data from polluted regions are of particular importance to assess success and consequences of atmospheric pollution prevention initiatives. The crucial outcome of the present study is threefold: (i) PM<sub>2.5</sub> showed a significantly decreasing trend within the period of observation, (ii) the trend of radiative forcing suggests an appreciable diminution of cooling, mainly caused by decreasing aerosol scattering but also by decreasing single scattering albedo of the aerosol, (iii) the latter effect seems to be caused by increasing contribution of light absorbing organic aerosol. These meaningful conclusions, based on a thorough analysis of high quality data sets, have poten-

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tial implications for climate research in general.

The paper is written and organized in a clear and succinct way. From my point of view, the manuscript is appropriate to ACP and I recommend a publication after some minor revisions.

Concerning the importance of results and their tight presentation, I feel some points deserve more discussion, e.g. the different seasonality observed for PM<sub>2.5</sub> and AOT (the role of meteorology is not really constraint by observational evidence). In addition a conceivable trend in local meteorology is worth to be considered due to its potential impact on air quality (is there some evidence for a “regional climate change”?).

#### Specific comments:

Page 9044, line 21-22: I guess that a nephelometer TSI Model 3563 (and not 3753) was used.

Page 9050, line 7: Figure 8 and not Fig. 7b is meant.

Page 9050, lines 11-12: Do you have an idea why the brown carbon burden increased at this site?

Figures 1 through 6: In general, the standard deviation of the monthly mean values should be presented in some way, to get an impression about the variability of the data (if error-bars cause confusing figures, a rough number specified in the caption may suffice).

Figure 4: The seasonality of the presented data points (monthly means) appears somewhat vague. Here, I would appreciate an additional plot showing the stacked mean seasonality as boxplot.

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Interactive comment on Atmos. Chem. Phys. Discuss., 14, 9041, 2014.