

Interactive comment on “Trends and variability of atmospheric PM_{2.5} and PM_{10–2.5} concentration in the Po Valley, Italy” by A. Bigi and G. Ghermandi

Anonymous Referee #1

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The manuscript of Bigi and Ghermandi presents the results obtained by the analysis of the datasets from 44 air quality monitoring stations within the Po Valley concerning PM_{2.5} and PM_{10–2.5} concentrations and sources for years since 2008. Monthly averages were studied for trends, seasonality and other components by the Seasonal Trend Decomposition procedure based on LOESS (STL) while annual trends were estimated by the Theil-Sen method. Overall it was observed that a significant decrease in monthly PM_{2.5} and PM_{10–2.5} occurred at the investigated sites, mostly during winter and for the fine fraction, with decrease slopes being steeper when moving from rural background towards urban traffic sites. A significant weekly cycle was found for several PM_{2.5} sites, possibly due to anthropogenic emissions, with this cycle occurring more often during summer. By performing the trend analysis with PM concentrations, emissions, vehicular fleet composition and fuel sales, results suggest that the decrease

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in PM levels is mostly due to the renewal of the fleet throughout the Po Valley, leading to a drop in fine particle emissions and precursor gases of secondary inorganic aerosol. The paper is well written and easy to follow, presenting an extensive study of an important area of Europe that exhibits important air quality issues.

General comment: It is not completely stated what the added-value of the new manuscript is, compared to the complementary one of Bigi and Ghermandi (2014). Is it the fact that the present one focuses more on the fine fraction? If this is the case, it should be highlighted more and maybe even present a comparison between findings for PM₁₀ vs PM_{2.5}. Other than that the manuscript is suited for publication.

Technical corrections: P9,L21-22: Propose to replace “the former”... “the latter” with “the first”... “the second” L29:...fog/precipitation events that occurred... L31: ...when inside most of the valley the coldest temperatures...were observed (move verb to the end) L34: This event featured extremely... (delete “was”) P10, L2: ...precipitation that occurred..

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