

# ***Interactive comment on “Trends of road dust emissions contributions on ambient PM levels at rural, urban and industrial sites in Southern Spain” by F. Amato et al.***

**F. Amato et al.**

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Reply to Anonymous Referee #1

“Authors should propose clear explanations on the reasons why equivalent contributions are found at traffic and urban background sites, while the last ones can be expected as being less influenced”

We agree with the referee in considering that road dust contributions should be higher at traffic sites. Possible explanations of the equivalent contributions at traffic and urban background sites are: 1) Contributions ranges are built on a limited number of monitor-

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ing stations (3 traffic stations and 2 urban background stations). 2) The upper limit of road dust contribution range is given by the Alcalá station (province of Seville) both for PM<sub>10</sub> and PM<sub>2.5</sub>. This station, although classified as urban background by the local air quality authority, is heavily affected by road traffic emissions (this information will be added at the revised version of the manuscript). The station is located in fact within a commercial center and, 700 m away, surrounded in two directions (North and East) by the A92 highway, which connects the cities of Granada and Málaga. Moreover, the nearby SE-40 highway has been under construction, with possible impact on road dust emissions in the area.

“Is the winter health effect of non-exhaust emissions mainly due to heavy metals emitted by abrasion processes, or to deicing salt/sand particles?”

The cited paper (Meister et al., 2011) does not specify to what aerosol type health effects are associated since no chemical analysis was carried out. However, the association with PM<sub>2.5–10</sub> was stronger for November through May, when road dust is most important (1.69% increase; 95% CI: 0.21%, 3.17%) because of the wear of stone materials in the asphalt by studded winter tires (Hussein et al. 2008; Omstedt et al. 2005).

Ref: Meister, K., Johansson, C., and Forsberg, B.: Estimated short-term effects of coarse particles on daily mortality in Stockholm, Sweden, *Environ. Health Persp.*, 120, 431–436, 2012. and references therein.

“The thermal-optical protocol used for EC-OC measurements should be mentioned and eventually discussed”.

The protocol used for EC-OC determination was EUSAAR2 (Cavalli et al., 2010). Cavalli F., Viana M., Yttri K.E., Genberg J., Putaud J.P. (2010) Toward a standardised thermal-optical protocol for measuring atmospheric organic and elemental carbon: The EUSAAR protocol *Atmospheric Measurement Techniques*, 3 (1) , pp. 79-89

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“Some explanations should be given on the choice of the 6 different dataset groups used for PMF analyses.”

The choice of the dataset groups was based on the principle of finding the best compromise with respect to: i) Distance between monitoring sites; ii) Similarity of PM sources; iii) Number of samples available at each site.

Reply to Anonymous Referee #2

“The results regarding the road dust trends at the traffic sites and industrial sites are adequately explained, although I agree with the other Referee’s comments on the fact that the similarities in road dust contribution between traffic sites and urban background sites should be better explained in the conclusions of the article.”

Please see first answer to Referee#1

“It would be interesting to explain in more detail the method of elemental analysis used for determining TC.”

TC concentrations were analyzed using a LECO SC-144DR. A 1% TC standard was used as in the calibration procedure. Previously, sample holders were submitted to a high temperature (1200°C) in order to eliminate any C compound. Precision and accuracy was less than 2% using a TC standard of 1%.

“I also recommend the authors some minor English revisions, for example in P. 31948, L. 1 - "maximum" and "minimum" instead of "maxima" and "minima" , or P. 31935, L. 11 - "(...) were found at (...)", instead of "(...) where found at(...)”.

We thank the referee for his corrections; these will be applied to the revised version of the manuscript.

“Figures S1, S2 S3, S4 and S5, and Tables S1, S2 (all referenced in the text) seem to be missing.”

The supplementary material is available at <http://www.atmos-chem-phys-C12243>

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