

Interactive comment on “Changes in particulate matter physical properties during Saharan advections over Rome (Italy): a four-year study, 2001–2004” by G. P. Gobbi et al.

Anonymous Referee #3

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In this paper, "Changes in Particulate Matter Physical Properties during Saharan Advections over Rome (Italy): A Four-Year Study, 2001-2004", the authors use surface observations, Lidar and a dust model to infer the frequency and magnitude of dust events occurring at Rome. They use a new metric to determine the background PM10 concentrations and find that a significant fraction of PM10 air quality exceedance are related to Saharan dust events, although dust alone is not sufficient to explain the exceedance of annual PM10 thresholds. The methodology and results are clearly presented and the paper is generally clear aside from some grammar issues in places (see minor comments). The paper is recommended for publication after addressing the minor comments below.

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Comments

It may be informative to include the fraction of days in which dust causes exceedance of air quality standards in the abstract.

It may be worth clarifying in the text that line 8 of table 3 indicates that in the absence of dust no exceedance would have occurred for this percentage of days (assuming this is the correct interpretation).

An interesting conclusion is that the background definition provided by the EU guidelines may not be optimum. If possible, it would be useful to see a comparison of the results between the two assumptions of background PM10 (e.g. numbers in brackets on Table 3 when using EU guidelines).

pg4976 ln 14 - is the 60-75% estimate based on extrapolation from figure 3 of Ozer et al. (2006)? If so, can you comment on whether you think there will be any difference between the TSP and PM10 relationship at the African site in that study and at the sites in Rome?

Minor revisions

Figures and Tables

Table 1 - requires units

Figure 2 - it may be beneficial to use the same y-axis scale for DREAM and VELIS to highlight the differences between the two

Figure 3 - the title is a little cryptic, either expand or explain in the caption

pg4964 ln6 - "such as"

ln13 - of (rather than from)

ln18 - over (rather than along)

pg 4969 ln2 - weighting

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pg4972 ln8 - missing "(1)"

pg4973 ln16 - "suffering from"

pg4974 ln9 - remove "an"

ln21-23 - the meaning of this sentence is not clear to me, consider rewording

ln26 "allowing the average extinction of Saharan layers to be obtained...?"

pg4976 ln18 - "responsible for"

pg4978 ln21 - "The main results..."

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 4963, 2013.