

## ***Interactive comment on “Meteorology during the DOMINO campaign and its connection with trace gases and aerosols” by J. A. Adame et al.***

### **Anonymous Referee #2**

Received and published: 30 September 2013

In the discussion article titled “Meteorology during the DOMINO campaign and its connection with trace gases and aerosols,” the authors, J. A. Adame et al., provide an extensive overview of the meteorology and upwind influences affecting El Arenosillo station in SW Spain during the DOMINO campaign. The paper is relatively well written and thorough. However, it is unclear what I, as an average audience member, can take away from this manuscript. Instead, the manuscript reads like an inventory of the campaign, perhaps most relevant to future work conducted with data from the site or a local air quality regulator. Furthermore, I am not sure whether this work is sufficiently different from the meteorological analyses presented in the other DOMINO-campaign ACP articles (E.g., Diescheh et al., has a very similar title, and characterize air masses according a very similar manner). If it is the intent of the special issue to provide a de-

C7542

tailed account of the DOMINO campaign, I see no harm in accepting this manuscript for publication (with revisions), but if the intent is that each work holds scientific meaning to the broader audience, this manuscript does not do so in current form and must be majorly revised to be considered for publication.

#### General comments

Overall, the manuscript reads as an inventory of methods, meteorology, measurements, the local terrain and emission sources specific to the SW of Spain. In the text, emission estimates, land use, winds, temperatures, moisture, regional characteristics, synoptic flow patterns, total particle concentrations, trace metal composition, and other characteristics are described or quantified in great detail, in some cases on a day to day basis, others on campaign-maximum basis, etc.

As a general reader, it is difficult to extract meaning from such a detailed discussion. Can the authors describe a more specific, novel approach with regards to diagnosing airflow patterns in a region of various influences? For example, does the higher resolution used in this HYSPLIT analysis add any information compared to previous studies? Are there singular or a class of species that characterize one source over the other? Have trace metal elements been used as a basis for characterizing O<sub>3</sub>-NO<sub>x</sub> photochemistry downwind of an Industrial Center (E.g., Huelva) versus a large urban center (e.g., Sevilla)?

Also, the authors provide a detailed analysis of the surrounding land use and emissions sources but neglect to mention soil NO<sub>x</sub> emissions. Is it likely that soil NO<sub>x</sub> contributes to NO<sub>x</sub> variability at this site?

#### Specific and technical comments

P19239 L4 – “Background environment” is subjective, please change. Based off the reported NO<sub>x</sub> concentrations, I would not consider this location to be background.

P19240 L2 – “aged ozone” is awkward. Also change “aged pollutants” throughout.

C7543

Perhaps “aged air parcels”

P19241 ~L10-20 – Please note which previous DOMINO works present an independent analysis of air-mass trajectories and meteorology. E.g., Diesch et al. seem to present a thorough analysis of transport patterns.

19242 L23 – Change “with a population of lesss than 4000 inh. . .” to (~4000 inhabitants)

P19243 L3 – capitalize Valley here and throughout manuscript

P19243 L6-7 – Awkward sentence. Change to something like “Sevilla is 75 km to the NE )

P19244 L2,11 – Please reconcile the different SO<sub>2</sub> estimates for Huelva. Also, the description presented in these paragraphs does not seem to advance or be necessary for the analysis.

P19245-47– Are these descriptions necessary? It seems that cited references and a very brief description (Limit of Detection, time resolution, etc) would suffice.

P19249 L20 – the C1-C4 classification seems unnecessary. Also, C1-C3 was used in description of instrument on page 19246.

P19250 L14 – Why is Land use definition considered to be scientific results? This sub-section also fits better directly after 2.3.

P19252 L3-14 – Is this information pertinent to the rest of analysis. Some this species description seems like superfluous information.

P19252 L21 – How do simulated wind speeds compare?

P19252 L28 – Again, change “aged pollutants” to “aged air masses” or equivalent.

P19253 L19-22 – Awkward wording “started.” Perhaps use word “originated”, “was located”

C7544

P19259 L16– I would not describe NO<sub>2</sub> conditions of 2 ppb as rural-background. I might call it rural, but background is subjective and unclear. Also, how are values of 1.90 +/- 1.89 reported when the LOD is 1 ppb? Change to 2 +/- 2 ppb.

P19259 L20-23 – Are these campaign maxima or campaign-average time-of-day maxima?

P19260 L3 – Again, report 1.02 +/- 2.13 as Change to 1 +/- 2 ppb when LOD is 1ppb. Also maybe a geometric mean, or non-Gaussian distribution is better for describing this dataset.

P19261 L27 – change “The K compound” to Potassium.

P19262– I found this to be the most interesting part of the analysis. Can these trace element measurements be used to characterize O<sub>3</sub>-NO<sub>x</sub> photochemistry downwind of different source types (e.g., Industrial-Huelva vs. Urban mix-Sevilla)

P19269 L13 – “the ocean”

P19269 L14 – Isoprene is not associated with maritime traffic. I suspect a mixed air mass is present.

P19270 L9 – Clarify the sentence.

Tables and Figures

Table 1 - Pie chart would be far more useful. There is no way that the number of specificity nor the level of quantitative detail provided here is necessary or relevant, and even harmful, towards conveying the desired message. E.g. what average reader will know the difference between an agroforestry area and a complex cultivation pattern?

Table 2- This information would be better represented by a time-series plot with air mass type on y-axis. Also the authors switch from classifying air masses as continental, marine and maritime (C1-C4) in the initial description to a classification based on regional overpass. Please maintain consistent language.

C7545

Table 3 and 4 – Can this information be presented more clearly? To me, table 4 makes more sense.

Figure 1 - Typeface on bottom right panel is not large enough.

Figure 2 and 4- information is redundant for the purpose of this work. Figure 4 is better.

Figure 3 – Typeface is way too small. Also, narrow the characterization. For the purpose of this paper I feel there should be about 4-8 categories (i.e., Urban, industrial, wood and shrubland, grassland).

---

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 19237, 2013.

C7546