

## ***Interactive comment on “The DAURE field campaign: meteorological overview” by O. Jorba et al.***

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The authors gratefully acknowledge the detailed revision and all the suggestions and comments of the Anonymous Referee #1, which may help to improve the quality of this manuscript and to clarify some issues that were not previously addressed.

Overall, the referee recognize the significance of the manuscript as a core reference for other DAURE papers concerning the meteorological conditions observed during the experimental campaign. The major concern of the referee is the lack of novel aspects of science. In this sense, the authors fully understand the referee's impression, and agree with the referee that with this kind of meteorological overview papers for field campaigns are not always easy to identify relevant scientific contributions. However, the authors strongly believe that the manuscript represents a fundamental basis for

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further analysis of the experimental observations obtained during the DAURE campaign. In this sense, the manuscript synthesizes the synoptic patterns and evolution for two whole months of 2009, and describes the mesoscale and microscale features observed with the available meteorological information. For that reason, the overview manuscript does not highlight specific events, but intends to describe the overall meteorological conditions of the period under study. From a meteorological point of view, it is not obvious to identify novel processes during March and July 2009, although some common meteorological conditions may have a strong impact on aerosol formation and transport. We believe that the present manuscript will contribute to simplify future analysis of aerosol episode formation within the area under study for the DAURE campaign.

Regarding the referee's suggestion about considering the present manuscript as “Supporting Material” to the first presentation and description DAURE manuscript, we would like to stress some points that justify the presentation of the meteorological overview as an independent manuscript. (1) The general DAURE manuscript will be focused on the presentation and description of the techniques used to measure aerosol composition and gas-phase precursors. A general summary of the aerosol behavior measured in both Barcelona and Montseny sites will be presented and discussed. To support some of the discussions, meteorological information will be used as case specific approach. In this sense, there won't be a complete description of the meteorological synoptic conditions and local mesoscale features developed during the whole campaign. (2) The participants of the campaign agreed to present in two separate manuscripts the meteorological overview of the campaign and the general DAURE manuscript about the experimental techniques applied to measure aerosol properties and gas-phase precursors conditions. The main idea was to provide two comprehensive manuscripts about the atmospheric and chemical conditions of the campaign. (3) In order to be able to discuss the complete meteorological scenarios occurred for the DAURE campaign a specific manuscript about the meteorological overview of the campaign is demanded in opinion of the DAURE participants. Therefore, the authors understand that the present manuscript will act as a strong supporting material for further analysis

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within the DAURE scientific community.

We attach an item-by-item response following to all the relevant statements of the referee.

Referee #1: "...perhaps something scientifically-novel should clearly be presented in the present manuscript."

Following the referee's suggestion, in the revised manuscript we highlight those meteorological scenarios that will contribute to an enhancement of the aerosol formation and accumulation. It has to be understood that this information will be complemented with future DAURE manuscripts focusing on aerosol formation, transport, accumulation, specific episodes, etc. Although, these scenarios may not be relevant from a meteorological point of view, their impact on particulate matter process are of largely interest. Thus, it is not easy to find novel findings in a meteorological overview manuscript.

Referee #1: "Whilst the figures and table convey lots of information, most of the text is verbose. In particular section 3 and 4 have lots of paragraphs of descriptions that seem not have a point."

In order to avoid the impression of verbosing text, the descriptions have been reduced in Section 3 and Section 4 of the manuscript. The authors understand that somehow descriptive style has to be maintained considering the nature of the manuscript.

Referee #1: "the abstract would benefit from being more concise."

Following the referee's suggestion the abstract have been reduced in length.

Technical Corrections:

The authors really appreciate the effort of the referee to identify and suggest corrections in detailed parts of the manuscript. In this sense, the authors have amended most of the referee's comments concerning the English and specific details of the text (clarification of some concepts, the use of acronyms, etc.). The manuscript uses now

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American English over all the text. Furthermore, an important revision of all the figures has been done. All the referee's suggestions to improve the technical presentation of the information have been introduced. In this sense, the trajectories in Figure 9 and Figure 15 are now included as supplementary material to improve its presentation and help the reader to appreciate all the details of the results. A major standardization between figures is now achieved.

Referee #1: "please choose either British or American English.."

The manuscript has been revised to use consistently American English.

Referee #1: "There are too many non-standard acronyms and initials which are not defined"

All the non-standard acronyms are now defined.

Referee #1: "The figures are not numbered correctly in the body text"

The figure numeration has been amended. An error occurred during the compilation of the latex version of the manuscript.

Referee #1: "4957 08 BCN is not an obvious initialism"

We have maintained BCN as an initialism of Barcelona, as is usually used in several contexts (i.e., we and several other groups always use BCN in scientific manuscripts, the web page of the city council is [www.bcn.es](http://www.bcn.es)).

Referee #1: "4985 18-21 I would delete theses lines, it just wastes readers' time"

We understand that it is formalism and there is no rule in scientific literature about the presentation or not of the sections' content at the end of the introduction. We find it useful and helpful for the reader.

Referee #1: "4955 03 remove "an" 4955 25 "...rain. The main..." is better 4957 16-17 down/up might be confusing - consider southwards/northwards 4957 17-18 for-

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mer/latter is difficult to read (e.g. try "Cold air mainly dominates...") 4958 17 "to" is not right here (maybe "with" would work?) 4959 03 should be "measurement techniques" 4959 11 I prefer "northeast" to "NE" (obviously be consistent throughout the manuscript) 4959 13 I would guess measurements are at 1.5 m (I appreciate that model levels are normally 2 m) 4959 13 I presume you mean "mean-sea-level atmospheric pressure" and not "surface pressure" 4959 14,17 It should be made clear the sampling rate of the instrument and any averaging done 4959 21 Please define PBL (although "atmospheric boundary layer" is perhaps more correct) 4959 22-23 This sentence does not sound correct, radiosondes do not normally measure both dewpoint and relative humidity. Plus, define "pressure" more precisely 4959 25 "daily cycles measurements" is not clear - please make clear 4960 22 Please clarify "are achieved adding the..." 4962 16 "...located in..." does not make sense; perhaps "centred on" is better? 4962 17-18 Such a generic and bold statement should probably be avoided - it makes it sound as if that is the only synoptic situation that exists 4964 05 Consistent terminology needed throughout the manuscript (e.g. "mean-sea level atmospheric pressure") 4965 15 Should be "temperature" 4967 23 The Stull reference is too general, the parcel method might be better references to Seibert et al. (AtmosEnv 34:1001-1027, 2000) 4970 04 Replace "to" with "with" 4970 17 Replace "this" with "these" 4970 23 Remove "The..." 4971 10 "highest" is ambiguous, try "greatest" 4972 02 Replace "to" with "with" 4972 09-10 "...Tables 1 and 2, but for the..." would read better 4972 11 "30\_C and 35\_C" would be better as "30-35\_C" 4972 12 Please avoid the word "significant" in research manuscripts unless you mean statistical significance (other places in manuscript also) 4972 16 "As can be seen in Fig. 5, ..." is an example of verbose text, e.g. try "The BCN meteogram (Fig x)..." 4973 09-10 Please avoid swapping terminology on mixing heights and PCL 4973 11 "mesolow" would perhaps confuse most readers 4973 16 Check entire manuscript for erroneous "see" when you mean "sea" 4973 21 Perhaps "...one day each." would be more accurate? 4973 23 This sentence is best placed in figure captions rather than the main body of text 4981 "Summary of surface meteorological", maybe you mean "near-surface"? (Caption of tables 1 and 3)

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4981 Please expand "min." and "max." to the full words (in captions of tables 1 and 3) 4981 Please quote to relevant accuracy levels, e.g. decimals in RH data is normally a form of noise. 4981 Please use consistent terminology with manuscript (e.g. "mean-sea-level atmospheric pressure")

All the above suggestions have been adopted in the revised manuscript.

Referee #1: "4959 16 Define CSIC"

CSIC is the acronym of the National Research Council of Spain in Spanish. To avoid confusion, we have maintained the English translation of CSIC and used CSIC among the text.

Referee #1: "4959 22-23 The vertical/temporal resolution of soundings should be noted"

The temporal resolution of the soundings is detailed in the manuscript. Regarding the vertical resolution of soundings, each sounding has a different vertical resolution, in this sense we can not specify a unique vertical resolution for the soundings.

Referee #1: "4960 02 Please define "BSC"

BSC is defined in the introduction section.

Referee #1: "4961 13 It is not obvious what "University PBL scheme" means here"

The Yonsei University PBL is the name of the turbulence parameterization used in the WRF model as stated in the manuscript.

Referee #1: "4965 20 It is not clear what "...low baric..." means"

It is a common term used within Spanish scientific community, it refers to stagnant conditions where the isobars present a low gradient over the area under study. To avoid confusion, stagnant conditions are used.

Referee #1: "4968 17 Should "pC" be "C"? It is confusing"

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Both in the manuscript and in the Tables “pC” and “C” are defined. Although it may be confusing, we prefer to maintain the former nomenclature to identify the days previous to the precipitation event scenario.

Referee #1: “Figures All figures need much more attention to detail, consistency, visibility, etc.”

Most of the referee’s suggestions have been adopted. The quality and clarity of the figures have now improved.

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