Response to Referee #1
Referee comments are in black, responses are in blue.

- Different time periods are reported in the text, sometimes 15y, other 14y and often 10y. Please check this aspect and try to homogenize the wording in this sense

The ReOBS approach is applied for sets of observations long of at least a decade. SIRTA-ReOBS file cover 15 years. This is now specified in the text.

- I counted 40 variables in table 2 and not fifty as stated in the paper. Please check.

Actually there are 42 lines in Table 2. Nevertheless, some lines refer to several variables: for example, "Soil temperature x[1] cm bellow ground, K" refers to 5 variables (at 5 cm, 10 cm, 20 cm, 30 cm, 50 cm, following the "[1]" note). Finally, there are 64 variables in the file. This is now specified in the text: L119 and L124 "fifty" has been replaced by "sixty". The following sentence has been added L390: "There are 42 lines in Tab. 2, corresponding to 34 variables currently in the file.".

- page 6, why a decade for the oldest one? you spoke about 15y....confusing for the reader

ReOBS is applied to datasets with some variables covering at least a decade, but more if available. For SIRTA-ReOBS, variables with the longest time cover are available over 15 years. This is now specified page 6 (L118 to L125).

- page 10: describe the flag 2 or its absence, not clear

flag 2 is now explained as follow in the text: "- 2: flag 2 is only used for internal control and is never used as an informative output in the ReOBS file", L220.

- page 11- Figure 3b, 3c and 3d do not illustrate the difference but the pdfs, these plots highlight the eventual differences

Following the reviewer comment, the sentence is now: "Figures 3b, 3c, and 3d illustrate the air temperature, wind speed, and cumulated precipitations Probability Density Functions (PDF) at three Météo-France stations within a 50x50km domain around the SIRTA supersite: in Trappes (48.8°N, 2.0°W), in Paris-Montsouris (48.8°N, 2.3°W) and in Orly (48.7°N 2.4°W): these plots highlight the eventual differences from one site to another.".

- page 11/fig 3c: Orly count seems to be lower in number respect to the others: are the pdf normalized or not? explain this better please.

These are relative occurrence, hence the sum of each curve is 100%. The fact that Orly curve seems lower in number must be a visual impression. For wind speed superior to 4.5 m/s, the Orly curve is always above the other ones. It is now specified in L243 that PDF are "in relative occurrence".

- page 12: how the weight are assigned? the text here should be clearer - page 13/table 3 how these numbers are set? Please explain.

The text has been clarified as follow: "A weight is assigned to each of the three stations based on the following method: the 50 x 50 km^2 domain is divided into 90.10^3 grid-boxes (300x300), the distance between each box and each site is calculated and then each box is linked to its nearest site. Then then percentage number of boxes linked to each site gives the weight of the site within the domain."

- page 15: clearly it is not possible to report here the sensitive tests but please explain in which sense you had this sensitivity test...

Sensitivity tests based on several case studies have shown that taking less than this 33% or more than this 40% thresholds leads to cloud base height values non-representative of what happens in the current hour. It is now specified in the text L340-342.

- page 16: "the lidar signal intensity is estimated using the scattering ratio" please rephrase because literally this is not correct. Additionally, in the Table 1 would be more correct to report Lidar backscattered signals

The sentence is now "We use the lidar scattering ratio SR...". In table 1, "lidar backscattered profile" has been replaced by "lidar backscattered signal".

- Table 2: you never refer into the text to the Lidar molecular profiles which actually is not clear to me what it is: typically, with lidar measurement molecular profile is not retrieved but assumed from external sources. Please explain better and eventually remove this variable from the dataset.

A paragraph as been added in Sect. 4.2 about that: "Lidar profiles that would be measured in clear sky conditions (so called molecular profiles) is necessary to build SRhisto and STRAThisto as it is used in the SR estimation and in tha STRAT lidar profile normalization. These molecular profiles are estimated based on temperature and pressure profiles measured twice a day by METEO-FRANCE radiosounding at Trappes (10 km from SIRTA). These molecular lidar profiles are included in SIRTA-ReOBS under the *Molecular* variable, as well as the altitude of normalization used for STRAT under the *Alt norm* variable."

- page 17: please explain why 2 versions of files are provided by ReOBS

One version do not contain the lidar vertical profiles so it significantly smaller and then easier to handle. It is now specified L402-403.

- page 19: line 1: instead of cloud optical thickness I suppose particle optical thickness (i.e. aerosol+cloud) is more suitable

cloud optical thickness has been replaced by particle optical thickness.

- Fig 6b: the ticks seem to be located not in the middle of corresponding bars but at left edge, please improve the plots in this sense

The figure has been changed following the reviewer comment.

- page 20-21 lidar simulator not clear. are these into the reOBS? In any case, would be much better to call it something like space-borne lidar observation simulator, because if I well understood is a tool for simulating the CALIOP signal to be expected if the

atmospheric scene observed by SIRTA is captured by the CALIOP.

No it is not into ReOBS, it is into COSP which is a package of different simulators. But, it is done for comparisons with lidar data that are actually into SIRTA-ReOBS (SRhisto). Into COSP, there are two lidar simulators: one is for simulating SR like the CALIOP, one is for simulating SR from a ground-based lidar such as the SIRTA one. This this last simulator which is described in our paper, as it is devoted to comparisons with SRhisto that are in SIRTA-ReOBS. It is now better explained in the "lidar simulator" paragraph page 21:

- Page 20: modify spatial with space-borne

With the reformulation of this paragraph, this expression do not occur anymore.

- lines 652-653 probably a cut& paste issue. Please check

We did not find any mistake on this lines but there was one just above so it is now corrected ("or the" has been added before "CLE-workshop").

- figure 9: report the caption of the color bar close to it and not as title

The figure has been changed following the reviewer comment.

- table3: please check formatting

We had trubles with the marges required by Copernicus, so we will fix that during the proof processes if the paper is accepted.

- table 1 & 2: the formatting could be improved. I would suggest to have the table horizontally oriented

We had trubles with the marges required by Copernicus, so we will fix that during the proff processes if the paper is accepted.

-line 403: check the reference

201 is now replaced by 2010