

# ***Interactive comment on “In situ measurements of desert dust particles above the western Mediterranean Sea with the balloon-borne Light Optical Aerosol Counter/sizer (LOAC) during the ChArMEx campaign of summer 2013” by Jean-Baptiste Renard et al.***

## **Anonymous Referee #1**

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The paper by Renard et al., presents in situ balloon-borne aerosol measurements with the Light Optical Aerosol Counter (LOAC) in dust layers over western Mediterranean. Measurements were performed either during the ascending phase of the balloon or in a quasi Lagrangian way at constant altitude and were compared to in-situ airborne and remote sensing measurements. The observations presented are important given the scarcity of similar observations within dust layers, and should be published after some minor revisions.

The technical descriptions of measurements are scattered throughout the manuscript (ie LIDAR, airborne, satellite) . It is strongly recommended that all technical details are given in a separate section described as material and methods, preferably before 2.Experimental strategy that could be a subsection. This will allow the reader to focus on the observations rather the technical details.

Specific comments:

Line 213:"July 2"

Line 244: Refer to the corresponding Figure 5.

Line 327: In this paragraph comparison to AERONET is briefly discussed and in Figure 12 a single measurement is presented to support the statement that LOAC and AERONET are in very good agreement. More data need to be presented, there must be several AERONET profiles available to compare. These data will be useful to the AERONET community as well, since these measurements may provide validation data for the inversion algorithms. Otherwise, that statement should be limited to a single day that good agreement was observed.

Line 344: This paragraph should be incorporated in Experimental strategy section, you are describing once again the flight patterns here.

Line 454: Evidence has to be given that this correlation exists otherwise this is rather a speculation and the sentence has either to be rephrased as a hypothesis or removed.

Figure 5. The same height resolution should be used, it is easier for the reader to compare the two plots.

Figure 11: Although the logarithmic scale shows good agreement between various instruments, it would be better to present concentrations in linear scale.

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Discussion paper

