

**Comments on Aerosol properties over the western Mediterranean Basin: temporal and spatial variability, by H. Lyamani et al.**

By François Dulac, 16 oct. 2014 (uncomplete version)

I am glad to see scientific valorization of data from the new AERONET station set up on the small remote island of Alborán during the project ChArMEx. Even though the measurement period is relatively short (~7 months), it reasonably covers the two Mediterranean summer and winter seasons. The analysis of this data set is complemented by (i) other coincident data from 3 AERONET stations in the westernmost Mediterranean region, (ii) a much longer time series from the relatively close station of Málaga, and (iii) shipborne data from a cruise across the Mediterranean and neighbouring marine areas of the Black Sea and northeastern Atlantic. I have some suggestions for a minor revision of the manuscript which can be found in the attached pdf file.

**Abstract:**

-Line 4: I would name here the 3 additional AERONET stations (Málaga, Oujda, Palma de Mallorca).

-Lines 12-19: I think the abstract would be better structured if the presently final discussion on Málaga data came just after Alborán results (before MAN results); this is because both Alborán and Málaga series appeal the same conclusion (which is not explicit in the present abstract but should be in my opinion): the dominant role of long-range transport on the aerosol load at the regional scale in the westernmost Mediterranean region.

**Introduction:**

-P.21525, lines 5-6: it is not correct that all satellite aerosol retrievals have low temporal resolution. MSG/SEVIRI AOD is available over the Mediterranean Sea with a 15 min temporal resolution ().

-P.21525, line 7: reference missing.

-P.21525, line 23: transported from European and North African urban...

-P.21526, line 26: westernmost part rather than western part.

-P.21528: name the three additional AERONET stations and give a minimum of information on the area covered by the MAN cruise considered.

-Let me mention our paper from Mediterranean AERONET data which I believe should be referred to in the introduction and at several occasions in this manuscript: Mallet et al., Absorption properties of Mediterranean aerosols obtained from multi-year ground-based remote sensing observations, Atmos. Chem. Phys., 2013.

### **Instrumentation and study sites:**

-I suggest using sub-sections and restructure this section: 2.1 AERONET measurements including p.21529 lines 10-28 and p.21530 sentence on line 12-13; 2.2 AERONET stations; 2.3 Maritime Aerosol Network measurements; 2.4 Airmass trajectories

-p.21529, line 1: any ref on the ship traffic and emissions ?

-A table is missing to provide details on the AERONET data set, including exact period, number of days for each month for the stations

-More details would be welcome on the MAN cruise. I suggest to reproduce the ship track with the different months of the period.

-Trajectories: they were probably computed only for days with AERONET measurements? Are they performed also for MAN observations?

-Some information on precipitation occurrences at the sites could be useful.

### **Results and discussion:**

- $\delta_c$  and  $\delta F$  could also be discussed in 3.1.

-Bottom of P.21532: can you exclude that air masses from the Atlantic with low  $\delta_a$  and low  $\alpha$  contain some dust after long-range transport from NW Africa?

-P.21533: line 24: the MODIS image is not very convincing; it would be better to show AOD product, especially from MSG/SEVIRI (see for instance the ICARE ChArMEx multibrowse tool at [http://www.icare.univ-](http://www.icare.univ-lille1.fr/browse/?sevir_aer_oc_l2_tau=true&caliop_l1_exp=true&north=50&west=-10&east=40&south=25&size=large&date=2011_08_26&rebuild=false&pointer=zoom)

[lille1.fr/browse/?sevir\\_aer\\_oc\\_l2\\_tau=true&caliop\\_l1\\_exp=true&north=50&west=-10&east=40&south=25&size=large&date=2011\\_08\\_26&rebuild=false&pointer=zoom](http://www.icare.univ-lille1.fr/browse/?sevir_aer_oc_l2_tau=true&caliop_l1_exp=true&north=50&west=-10&east=40&south=25&size=large&date=2011_08_26&rebuild=false&pointer=zoom)).

-P.21533, bottom: Which fraction of days would be misclassified?

-P.21534, lines 10-15: can you exclude dust particles in the fine mode?

-P.21534, line 17: I would add “which indicates that the contribution of mineral dust to the fine mode fraction of AOD is probably significant”.

-P.21534, line 17: I would add “which indicates that the contribution of mineral dust to the fine mode fraction of AOD is probably significantcan you exclude dust particles in the fine mode?”

-P.21535, line 1: such formulation suggests that Italy should be the source, but central or eastern Europe can well be concerned.

### **Editorial comments:**

P.21525, lines 19 and 24: lower case for oceans and seas.

P.21525, lines 25: forest fires (plural).

P.21526, line 26: westernmost part rather than western part.

P.21527, line 24: there is no study.

P.21528, line 8: a MAN cruise.

P.21528, line 10: implementation.

P.21528, line 24: 50 km (with a space).

P.21528, line 27: I suggest "There is no significant local anthropogenic emission source at Alborán".

P.21529, line 11: specify "automated sun photometer.

P.21530, line 19: specify "hand held sun photometer.

P.21532, line 29: specify during the wet season from November to July.

P.21535, line 17: increase.

P.21535, line 26: there was no[...] intrusion.

P.21536, line 6: On the other hand.

P.21536, line 23: in comparison with the Alborán station.