

## ***Interactive comment on “Long-term real-time chemical characterization of submicron aerosols at Montsec (Southern Pyrenees, 1570 m a.s.l.)” by A. Ripoll et al.***

### **Anonymous Referee #2**

Received and published: 14 December 2014

This paper presents long-term ACSM data from a remote mountain site in Spain. This is a relatively new instrument, but as the ACTRIS network matures, datasets of this nature are becoming more commonplace. Nevertheless, the work here could be considered novel because it is the first time this has been presented in this specific environment. The fact that it is such a remote site makes it important when considering regional transport and transformations. The paper is largely well-written and most of the comments I have are of a technical nature.

General comments:

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The paper has a very large number of figures, so it is expected that many will be in the form of supplementary material rather than in the article itself. However, I sometimes feel that some of the most pertinent and interesting figures are actually the ones in the supplement rather than the main article. As a case in point, Figures S2 and S3 are referred to 3 times each in the text, whereas figures 7 and 8 aren't referenced at all. I would suggest that the authors consider moving these into the main article and the ones less important to the conclusions of the paper moved out.

I think the finding that the agreement with other instruments was improved when the OA was scaled is an important one and perhaps underplayed. On a technical level, this will have implications for all other ACSM (and potentially AMS datasets). Further investigation of this and exercising care in the quantitative use of ACSM OA data in the meantime should be key recommendations of this work.

Minor/technical comments:

P28815, L2: How close is 'very close'? The authors should be specific here.

P28815, L16: What other instruments are being referred to here?

P28816, L4: 'Standard' gravimetric analysis is referred to, but there are many important procedural variables to consider, such as sample conditioning. More detail should be supplied here, or if a specific procedure was being followed (e.g. FRM), this should be referred to.

P28816, L10: The model number of the OPC should be 1.107, not 1107. The refractive index assumed in its calibration should also be specified, as this is likely to have a significant effect on the quantitative volume concentrations.

P28817, L1: The model number of the classifier unit (e.g. 3080) should also be given.

P28817, L16: As I understand, HYSPLIT does not calculate the boundary layer height as such; it is a part of the NCEP reanalysis, that it can report it as a diagnostic. Regardless, more information should be given on how this quantity is derived and how it

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should be interpreted because clearly, a boundary layer height below the altitude of the site is not representative of the mixed layer at the site itself.

P28818, L2: The slopes and intercepts from the regressions should be given here rather than referring to the supplement.

P28819, L19: The other site and period of the measurements should be specified, such that the other study can be identified in the future.

Figure (general). The text and lines are too small. Please make these larger.

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Interactive comment on Atmos. Chem. Phys. Discuss., 14, 28809, 2014.

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