

The authors present a very comprehensive and extensive data set that has been uniformly quality assured, processed and analyzed. The data is put in proper geophysical 4-dimensional context. They provide an appropriate initial, internal statistical analysis. The limitations of the data set and their initial analysis is well posed and, as they note, it is ready for second level analysis and use by the larger community.

The graphics is excellent in terms of content, ease of interpretation (excepting a few) and attention getting, eye-candy as well. Fig. 12, 13, 15 take a while longer to digest but I have no further suggestions. The inset in 13 helps a lot.

A statement, even a general statement, regarding the uncertainty of the main Aitken and accumulation mode statistics in the tables would be in order. If this could be put in the context of synoptic or seasonal variability that would be adequate, ie. very much less than, less than, comparable to, etc.

Specifics:

Page 8911

“The number size distributions of particles are higher in summer than in other seasons, especially for the Aitken mode particles with dry diameters from 50 to 100 nm. This elevated number size distributions are accompanied by a slightly larger diameter of median distribution Aitken mode.”

There is some room for confusion in the text here. I suggest that it be clearly specified whether you are referring to the particle number concentration that is “greater than” (lower or less than) or the modal, mean or median diameter that is larger (smaller). Adjectives such as “higher” should be avoided where possible. “Smaller” should not be used to refer to concentration, only diameter. Eg.:

The number concentrations of particles are greater in summer than in other seasons, especially for the Aitken mode particles with dry diameters from 50 to 100 nm. These elevated concentrations are accompanied by a slightly larger median diameter of the Aitken mode.

Page 8912

At high-altitude sites (defined as height over 1000m above mean sea level), aerosol number size distributions are similar, even there are...

At high-altitude sites (defined as height over 1000m above mean sea level), aerosol number size distributions are similar, even **though** there are...

Page 8916

It would be good to put this in context for cloud physicists with a sentence stating the critical cloud supersaturation and assumed (say sulfate) chemistry associated with 50 and 100 nm size limits. I know you said you would ignore this point and you did refer to McFiggans but a sentence from his work would be worth it in my opinion.

Bimodal does not need to be hyphenated.

There are very little seasonal changes...

Change to:

There are very few seasonal changes....

Or

There is very little seasonal change....

Page 8917

.... widely distributed over the concentration axis with a **bimodal** histogram...

Might as well use bimodal consistently rather than two-modal here and later also.

Page 8920

The particle concentrations nearer to sources are known to show a weekly cycle in number concentrations (van Dingenen et al., 2004; Rodriguez et al., 2007), but the relative remoteness of most of the stations and annual averaging have could have removed an anthropogenic weekly signal from our analysis.

The particle concentrations nearer to sources are known to show a weekly cycle in number concentrations (van Dingenen et al., 2004; Rodriguez et al., 2007), but the relative remoteness of most of the stations and annual **averaging could have removed** an anthropogenic weekly signal from our analysis.

Page 8921

The question of representability is dependent on which kind of representability is actually expected by the data user.

“representativeness” would seem to be the better term (as used by Henne et. al. in their title) even though it is less mellifluous than representability.

In table 4 it would be convenient for the uninitiated, geographically challenged, if full station names were added before the code.

Page 8968 fig 8

The lines are distracting. Color coding is clear enough particularly for the seasonal histograms.

“equal log” rather than “log-evenly” seems more commonly used.

Fig 13 caption

The **color coded** numbers **in the plot** indicate the **coordinates** of **the** geometric means of both concentrations for each station.