

## ***Interactive comment on “Elemental carbon in snow at Changbai Mountain, Northeastern China: concentrations, scavenging ratios and dry deposition velocities” by Z. W. Wang et al.***

**Anonymous Referee #1**

Received and published: 11 July 2013

Recommendation: accept after minor revision.

### COMMENTS

p 14223 line 8. Cite also the comprehensive assessment of Bond et al. (2013).

p 14224 line 6. Cite also Wang et al. (2013).

p 14224 lines 22-23. "Changbai Mountain . . . (Fig. 1)". The mountain is not shown on Figure 1.

p 14225 lines 14-15. "The melt water was immediately filtered through a quartz mi-

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crofiber filter". What fraction of the BC passes through the quartz filter without being caught? Forsström, Ström, Pedersen, et al. (2013) found undercatch values of 2-53%.

p 14229 line 23 "typically around 300 ng/g except one high value (623 ng/g)". There is a second high value (855 ng/g) shown on Figure 4.

p 14230 line 17. Give units for all four quantities in this equation.

p 14231 lines 10-11. "[scavenging ratio is] much smaller than those from Zeppelin". Give the value of the scavenging ratio for Zeppelin.

p 14233 lines 23-25. "Elemental carbon concentrations . . . 7636 ng/g . . . which is comparable to those found in Europe in the early 1990s". Give a citation; 7636 ng/g seems too large for Europe, by two orders of magnitude.

p 14234 line 3-4. "scavenging ratio . . . 149.4, which is much smaller than those reported from Arctic sites". This is not true; Noone and Clarke (1988) reported a scavenging ratio of 100 for Arctic Sweden.

Table 1. Compare these values to the BC values reported for Changbai Mountain by Wang et al. (2013); Site 39 in their Table 1.

Figure 1. The mountain that appears in the title of the paper is not shown on this map.

Figure 7. What are the hatchings on the gray bars? They are not identified in the legend. Also, a legend is given for  $V_d$ , but no data corresponding to these bars are plotted. Reduce the clutter on the right-side vertical axis tick labels, by changing units from m/s to mm/s. Then for example " $2.0 \times 10^{-3}$ " becomes just "2".

Figure 8. The gray-shade shown in the top legend for daily mean temperature is not used in the figure.

### SPELLING AND GRAMMAR

p 14222 line 22. Probably you meant to say something other than "mean median".

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p 14227 line 7. Change "relatively humidity" to "relative humidity"

p 14231 line 10. Change "Zepplin" to "Zeppelin"

Figure 3 vertical axis label. Change "Relatively humidity" to "Relative humidity".

Figure 4 internal label. Change "Chanbai" to "Changbai".

Figure 5, internal label, change "Zepline" to "Zeppelin". Vertical axis label, change "ug" to "(Greek letter mu)g"

Figure 7, vertical axis label, change "ug" to "(Greek letter mu)g".

#### INAPPROPRIATE ACCURACY

The number of significant figures given is excessive, in comparison to the standard deviations given. Rounding appropriately will also reduce the clutter, making the paper more readable. Some examples:

p 14222 line 12. Change " $137.4 \pm 99.7$ " to " $140 \pm 100$ ". Change "149.4" to "150".

p 14227 line 18. Change " $987 \pm 1510$ " to " $1000 \pm 1500$ ".

Table 1 all entries; e.g. change  $1418 \pm 1728$  to  $1400 \pm 1700$ .

Figure 4 all entries; e.g. change 258.7 to 260; change 1392.5 to 1390.

#### REFERENCES

Bond, T., et al, 2013: Bounding the role of black carbon in the climate system: A scientific assessment. *J. Geophys. Res.*, 118, doi:10.1002/jgrd.50171.

Forsström, Ström, Pedersen, et al., 2013: Elemental carbon measurements in Arctic snow packs. Submitted to *J. Geophys. Res.* (obtain from your coauthors J. Ström and C.A. Pedersen).

Wang, X., S.J. Doherty, and J. Huang, 2013: Black carbon and other light-absorbing impurities in snow across northern China. *J. Geophys. Res.*, 118, C4695

doi:10.1029/2012JD018291.

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