

# ***Interactive comment on* “Characterizations and source analysis of atmospheric inorganic ions at a national background site in the northeastern Qinghai-Tibet Plateau: insights into the influence of anthropogenic emissions on a high-altitude area of China” by Bin Han et al.**

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Received and published: 7 February 2019

The paper is well written and covers a important topic relevant to air pollution in China. before being published I have the following comments and suggestions related to the manuscript: 1- " Researches" should be changed to "Research" because it is plural (lines 90, 159). You can also use "Studies".

Line 30: change understand to identify Line 152: include reference All downloaded

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equations couldn't be checked (not clear) Line 216 add data after observations

Fig 4: Why high ozone peaks at hours 1 to 2 in Fig 4? Why does the ozone value at night increase to a value greater than that during the day?

Fig 4 SO<sub>4</sub> displays wide fluctuation between hrs 12 and 20 with hour to hour fluctuations of about 2 μ/m<sup>3</sup>, or about 15% of the absolute value. An explanation regarding the possible origins of these transients would be useful. Is this variance the true measure of the uncertainty of the SO<sub>4</sub> ion concentration? If so, then the findings and conclusions should be recast in the context of the uncertainty of these data variabilities. If these data are averages over a number of days then correlation with wind direction etc. could be useful in identifying the origins of such variations and may aid in apportioning sources.

Fig 4 NO<sub>3</sub> exhibits similar variability over the period of hour 12 to 18 with again wide fluctuations. Hours 14, 15 and 17 tend to be small while 16 is much higher. Again is this the true uncertainty of these data or are there other factors driving or pertaining to the variability (In both SO<sub>4</sub> and NO<sub>3</sub>). A correlation plot with the prevailing wind direction and speed could be useful as these fluctuations may be a results of wind direction changes and may provide additional data regarding sources. In addition, these fluctuation will have significant influence on the NOR and SOR, at least an uncertainty value should be assigned to the NOR and SOR.

If the above points are considered in the context of the scatter of data displayed in figure 5. Since ozone and RH data trends shown in figure 4 appear to be relatively well defined, then the scatter in these data in figure 5 are consequently driven by the variability of the SOR and NOR. Following further, since SO<sub>2</sub> and NO<sub>2</sub> are also well defined in fig 4, then the variability in SOR and NOR is driven by the concentration of the respective WSI species. A careful analyses of this variability and a discussion with regards to the implications of these uncertainties to the conclusion drawn from figure 5 would be useful to the reader.

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-1345>, 2019.

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