

Interactive comment on “Chemical characterization and sources of submicron aerosols in the northeastern Qinghai-Tibet Plateau: insights from high-resolution mass spectrometry” by Xinghua Zhang et al.

Anonymous Referee #3

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This paper presents near real time high resolution aerosol measurements, looking at the chemical composition and sources of organic aerosols. The measurements were taken at a high-altitude background site, northeast of Qinghai-Tibet Plateau, July 2017. The authors found SO₄ to dominate PM₁ concentrations and identified four different OA sources after PMF analysis. The research presented in this paper will help to better understand OA chemical composition and sources. Overall, the manuscript is well written with a good work on the use of references. The paper, which fits well within the scope of ACP, is recommended to be published after working on the following minor

C1

comments.

Page 2 line 60. Rephrase it, i.e. conducted aerosol composition studies. Page 2 line 63. Rephrase it, i.e.: Similar results were also found by Li et al. Page 2 line 69. Check and rephrase the following paragraph: In addition, air pollutants to the northern QTP could also from the central Eurasian continent where locates in the upstream of the northwest of China, although relatively lower air masses presented comparing with those impacted by anthropogenic emissions from China and the Indian subcontinent (Xue et al., 2013). Page 2 line 77 Rephrase the following paragraph: The real-time measurement of atmospheric aerosol chemistry with high time resolution is still relatively rare in the northern QTP until now Page 3 line 79. Not all AMS instrument provide size distribution. Page 3 line 84. Change to “References therein”. Page 3 line 86. Change to “Detection limit”. Page 3 line 112. Change to “is located at the top” Page 4 line 125 Change to “Aerosol measurements” or rephrase it. Section 2.2 Instrumentation. It would be good to add the sampling time of all the instruments. Page 6 lines 202-208. I would move this paragraph to either results or supplement as it is part of results. Page 8 line 283. What is the purpose of comparing these two methods? And/or what is the reason of the increased ratios? Page 9 line 362 Change to “correlated”. Page 9 line 362 I would not say that BBOA correlated well with C₂H₄O₂⁺ with R² = 0.3.

Technical comments.

A small paragraph about OA sources in these type of sites could added to the introduction. There is not introduction about OA sources while this topic is the focus of this paper. In the mass spectra shown in figure 5, the mass spec agBBOA looks like a semi-volatile OA. More details could be added, perhaps to the supplement, about the analysis mentioned in lines 359-361 to confirm the presence of BBOA, someone would argue you can see a BBOA in summer and it could be more questionable the fact that you are identifying two types of BBOA. A few lines supporting these two BBOA profiles are suggested. The authors can also add, maybe to the supplement, more details on

C2

the way they selected the four factor solution, information about the Q/Q_{exp} values, residuals, etc.

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