

Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2021-83

Anonymous Referee #3

Referee comment on "Measurement report: Saccharide composition in atmospheric fine particulate matter during spring at the remote sites of southwest China and estimates of source contributions" by Zhenzhen Wang et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-83-RC1>, 2021

The paper entitled "Saccharide composition in atmospheric fine particulate matter at the remote sites of Southwest China and estimates of source contributions" by Zhenzhen Wang and colleagues provide the characteristic of saccharides during spring 2019 at Lincang, a rural site in Southwest China. The authors reported molecule tracers including anhydrosugars, mono (di) saccharides and sugar alcohols, combined with statistical analysis and HYSPLIT model, they concluded that biofuel and open biomass burning (BB) activities could have a significant impact on ambient aerosol levels at Lincang. Overall, this paper is logically organized, and knowledge of this work is needed and helpful for better understanding air conditions in Southwest China. The topic of this paper is within the scope of the journal Atmospheric Physics and Chemistry. I would like to recommend this paper published after the following of my concerns be resolved.

Major comments:

- The surrounding environmental condition is crucial for understanding the results, I strongly suggest the authors added a figure to show the sampling sites as Figure 1. This figure should include some necessary information about the topography, vegetation, residential area nearby Lincang, and photos of three sampling sites are also crucially needed.
- The source appointment is mainly based on the 72h backward trajectories of HYSPLIT model. However, high uncertainty existent for the application of HYSPLIT model at high elevation site because topographic relief. The frequencies of HYSPLIT or meteorological analysis should provide more creditable results.

Minor comments:

- The samples of this work are mainly in spring, the title should be changed to "Saccharide composition in atmospheric fine particulate matter during spring at the remote sites of Southwest China and estimates of source contributions".
- Line 62, Wu et al., 2020 is not cited in references.
- Line 71-72, "10.1-383.4 ng m⁻³ over the Tibetan Plateau (Li et al., 2019)", the reference Li et al., 2019, EP is glacier cryoconites not aerosol samples.
- Line 75, Sichuan Basin, not "Chengdu Basin".
- Line 79-81, Levoglucosan emission of China is estimated by BB activities by Wu et al., 2021, this sentence is not rigorous.
- Line 109-112, you should better add some references.
- Line 116, do you have samples over other period?
- Line 126-130, please add a figure for sample sites.
- Line 183, why do not use meteorological data at Lincang?
- Line 231-233, "no distinct variation", has statistical significance?
- Line 239-248, samples in those references are not collected at the same period.
- Line 276-277, how about the L/M for burned ghost money?
- Line 290-291, references for L/K⁺?
- Line 431-441, Figure 4, only one air mass from Hengduan Mountain region. Maybe frequency is better for understanding air sources.
- Line 450-452, how about the atmospheric dynamics for aerosol transport from Southeast Asia to Lincang, especially for residential cooking and heating.
- Line 512, ng m⁻³?
- Line 521, only Myanmar.