

***Interactive comment on* “Simultaneous Measurement of Urban and Rural Particles in Beijing, Part II: Case Studies of Haze Events and Regional Transport” by Yang Chen et al.**

Anonymous Referee #2

Received and published: 1 April 2020

The authors conducted two parallel studies at both urban and rural sites of Beijing, using the single-particle chemical composition as a tracing system to investigate the impact of heating activities and formation of haze events in the region. The authors argued that different types of particles were emitted between the urban central heating supply and the residential heating in the countryside. Interestingly, the authors proposed a hypothesis that the regional transport of particles could trigger heavy pollution. The study pictured the interactions of pollutants between and urban and rural sites. The reviewer recommends publications when the following concerns are addressed. Major Issues: 1. Introduction. Can the authors describe the difference between the bulk and single-particle analyses? Are there any advantages of this work compared to those

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in the literature? The authors need to provide detailed information on the aim of the study. 2. The reviewer suggests analyzing the pollution events 2,3 and 4 because the detailed temporal trends are available; the missing data in E1 make them not solid. 3. Does any evidence suggest the OC-Nit-Sul formed locally? 4. The statement that the regional transport can trigger the pollution event should be clarified. The connection between wind speed with the events is not conclusive enough. Is there any additional evidence that could be provided to make a solid decision? If not, the statement could be strained based on the current data. 5. The Implication part is more like a Discussion; please consider changing that. Minor issues 1. Typos need to be checked carefully, a proofread is needed for revision. 2. Through the manuscript, terms like “fractions” and “ratios” are both used. Are they the same meaning? Please clarify and be consistent if possible. 3. Line 116, please tidy Table 1, which is messy at the end. 4. Line 138, why is there two Table 1? Please check. 5. Line 175: " control emissions from household emissions" fix the typo, please reword. 6. Figures 9 and 10, please label the Events on each panel. 7. Careful proofreading is needed.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-1118>, 2020.

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