Atmospheric
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Discussions

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comment

Interactive comment on "Local and regional contributions to fine particulate matter in the 18 cities of Sichuan Basin, southwestern China" *by* Xue Qiao et al.

Anonymous Referee #1

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Qiao et al. "Local and regional contributions to fine particulate matter in the 18 cities of Sichuan Basin, southwestern China"

This is an interesting study about the relative PM2.5 contributions from local and non-local emissions. It is well written and provides valuable information for understanding the air pollution over Sichuan Basin. I recommend its acceptance for publication after minor revisions.

General Comments (1)For study reviews regarding the relative contributions from local and non-local emissions, a recent paper by Zhao et al. (2019, DOI: 10.1029/2018JD028888) could be cited, which showed the significant local emission

contributions in an industry city over North China Plain region. In this study, they proposed an observation-based method: they determine the local primary emission contribution based on network observations of PM2.5 in a city. Moreover, Zhao et al. (2018) also estimated the contributions of local primary emission, transport, and secondary formation based on a dispersion model. It could be also cited in Lines 58-60, 63-66, 216-218. (2)The reasons for your source region classification should be provided. Moreover, uncertainties in the analysis results caused by potential errors in the a priori emission maps should be investigated, or at least briefly discussed. (3)If possible, comparisons with observation-based results will be very helpful and necessary. (4)The paper is well written. However, a few writing issues could be solved with a careful revision. For example, blank space is needed between references in the context.

Detailed comments: Line 46-48, Before diving into aerosol transport, the potential sources for aerosols should be introduced, such as local emission, transport, and secondary formation. Actually, Zhao et al. (2018, Growth rates of fine aerosol particles at a site near Beijing in June 2013) have shown strong fine aerosol growth rates, which could contribute a lot to measured aerosols. Zhao et al. (2018) mentioned earlier also showed strong local emission contributions in an industrial city Line 63-65, Qiu et al. (2019, DOI: 10.1021/acsearthspacechem.8b00155) could be cited, which made the source appointment analysis based on PMF method. Line 67-68, This is not a complete sentence. Line 100-104: Shi et al. (2017, Spatial Representativeness of PM2.5 Concentrations Obtained Using Observations From Network Stations) indicated the spatial representativeness of local PM2.5 observations using observations from network stations, which shows that PM2.5 varies a lot with space and the spatial representation of surface site PM2.5 observations are generally small (0.25-16 km2), which could be used to support the point proposed here - the spatial resolutions of meteorology are too coarse to meet the study goal. Section 2: How did you set up the 9 source regions? What are your basis, climate basins? Line 137, "domains" -> "domain" Line 174, "CMAQ default profiles" Line 183-186, "were downloaded" -> "downloaded" or "that were downloaded" Line 191, unit should be provided for 2.0

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2018-1214, 2019.