

Interactive comment on “Observations of the atmospheric boundary layer structure over Beijing urban area during air pollution episodes” by Linlin Wang et al.

Anonymous Referee #2

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This paper investigated the dynamics of urban boundary layer (UBL) in Beijing during a severe air pollution episode (1–4 December 2016) and interactions between UBL and surface energy balance (SEB).

Although the topic of this paper fits the scope of ACP, the major drawback lies on the rather isolated analyses: how synoptic conditions, surface energy balance and urban boundary layer evolution interact with each other is not elaborated. Moreover, the feedbacks between these processes are not well summarised, which are expected to appear in the conclusion but unfortunately not.

Also, given the context of this work being a megacity, urban signatures involved in the

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urban SEB and PBL dynamics (e.g., anthropogenic emissions, urban morphology, etc.) are largely missing in relevant discussions.

That being said, the separate analyses of synoptic conditions, SEB characteristics and UBL development are sound with detailed descriptions and appropriate comments on relevant studies.

As such, this paper does show potential for publication after the above concerns are well addressed in a revised form.

Specific comments: L253–255: This is not well justified: Traffic emission might not be increased as commuters may be less during weekends than weekdays. L442: It would be good to comment on the possible impacts of anthropogenic heat on the estimates of urban heat storage. L503: the physical meaning of RSCS gradient is better to be provided. Figures 2, 4, 5 and 6: corresponding dates should be explicitly annotated below the x-axes for better legibility.

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