

## ***Interactive comment on “Introduction to Special Issue – In-depth study of air pollution sources and processes within Beijing and its surrounding region (APHH-Beijing)” by Zongbo Shi et al.***

**Anonymous Referee #2**

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This manuscript provides an overview of the APHH-Beijing project including the objectives, the research themes, the measurement and modeling activities, the fundamental air quality data, and so on. The authors spend a large body of the main text describing in detail the background, justification, and the to do lists of this project, making this manuscript more like a white paper or a proposal draft. I understand that the purpose of this manuscript is to provide a starting point and an introduction for readers who are interested in many future publications that are likely to result from this international collaborative program. However, to be qualified as an ACP research article, the authors need to provide more sciences in the manuscript, as suggested below.

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1. There have been many field campaigns, e.g., CAREBeijing, organized in the past 10 years targeted on investigating the air pollution and its health impact in Beijing. Compared with all those previous studies, what is unique about the current project? What are the scientific challenges this project aims to solve?
2. There are four research themes presented: sources and emissions, atmospheric processes, health effects, and solutions. The last two only appeared in the very first part of the manuscript, no scientific output can be found later on. To make this manuscript completer and more consistent, primary results related to the health impacts need to be given.
3. One focus of this manuscript is the overview of two joint field campaigns. Indeed, there are lots of discussions regarding the site information and type of instruments, but these discussions are not necessarily useful, as any future publications related to these two campaigns would have to give similar descriptions in their methods section anyway. Instead, this manuscript could be a nice platform for a detailed instrument calibration and comparison, data analysis and uncertainty quantification, and so on.
4. The last two sections describe the air quality, e.g., the average concentrations and diurnal patterns of common air pollutants like NO<sub>x</sub>, O<sub>3</sub>, PM<sub>2.5</sub>, and etc., during the two field campaigns. As the authors highlighted earlier that regional modeling is an essential part of the campaigns, a modeling vs. observation comparison in terms of temporal profiles of these common pollutants need to be provided.

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