Atmospheric
Chemistry
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Discussions

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Interactive comment on "Assessment of meteorology vs control measures in China fine particular matter trend from 2013–2019 by an environmental meteorology index" *by* Sunling Gong et al.

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Replies to Questions by Referee 2

It has been a long-standing problem to quantify the roles of meteorology and emission change in regional air pollution variations. Different modeling tools and techniques have been developed and utilized to address this problem. In this study, the authors developed a process analysis-based framework in a chemical transport model named CUACE to identify the driving factors of PM2.5 changes in China during 2013-2019.

They defined an Environmental Meteorological Index (EMI) by tracking the contributions of different physical processes including transport, diffusion, emission, and deposition to simulated PM2.5 concentrations in the model. The topic is within the scope of the journal and the research question is of broad interest in the community. In general, the manuscript is well-structured, but the English writing in some parts (especially the methodology section) can be improved for clear description. Based on the current version, I have some major concerns about the theoretical basis of this EMI framework. Please see below the detailed comments to be addressed.

Reply: The methodology section has been revised to clarify some descriptions, which may have caused certain confusions for the referee to raise the questions (1) and (2) below.
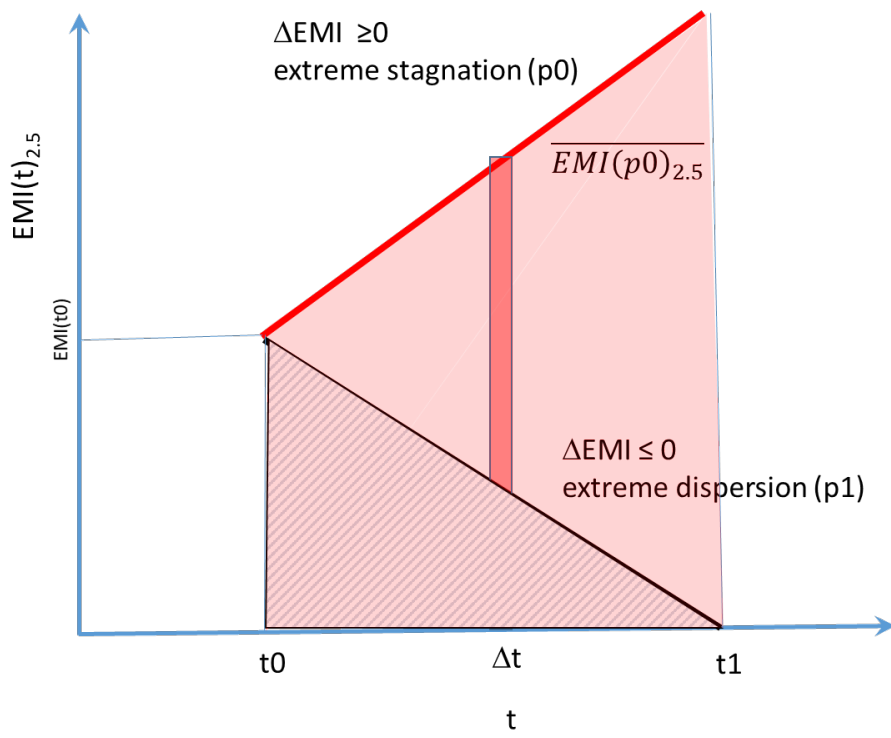
[Due to equations and special characters used in the questions and replies, please see the full reply in the Supplement by PDF]

Please also note the supplement to this comment:
https://acp.copernicus.org/preprints/acp-2020-348/acp-2020-348-AC2-supplement.pdf

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2020-348, 2020.

Fig. 1. Illustration of relationship between 3 levels of EMI definition for the cases suggested by Referee #2

C3