Atmos. Chem. Phys. Discuss.,
doi:10.5194/acp-2015-710-RC1, 2016

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Typical synoptic situations and their impacts on the wintertime air pollution in the Guanzhong basin, China" *by* N. Bei et al.

Anonymous Referee #1

Received and published: 19 February 2016

This paper develops a meteorological classification for the Guanzhong basin to be used for analyzing air pollution. A subjective method is used based on meteorological reanalysis data. The classification is shown to correspond to different levels of PM2.5 in the basin. The WRF-Chem model is used to evaluate in greater detail an example day for each of the six categories developed in the classification. Overall the paper is clear and the results are relevant, and hence publication is recommended.

Major comments:

It would be helpful to have a bit more description of the subjective procedure used for the classification. Composites could be shown in supplementary material, or some other figure indicating how well defined each group is.

Printer-friendly version

Discussion paper

Line 309 and Fig. 7: There should be a better description of what is done for the divergence and vertical velocity. In particular, divergence is usually a sign of suppressed mixing. However, for 1/19 and 12/26 we see both divergence and high mixing heights. The text then claims that the divergence leads to “outflowing of pollutants.” Is this not a more straightforward case of strong winds from the north blowing pollutants over the mountain towards the south (rather than towards the east along the basin)? This seemed like a weak part of the paper. I would recommend removing it and including a figure focused on horizontal wind speed and vertical mixing height instead.

There is a brief allusion to dust when discussing Fig 10, but no other mention. It seems that there should be some more discussion of this including some references about dust transport from the north.

The results section is at times confusing and hard to follow, I would recommend some more editing.

Minor comments:

The figure captions should be expanded and be more descriptive. Eg. what is the orange area in Fig. 2? Fig. 6: The transect could be shown in Fig. 1? There is no reference for MOZART. Line 217: This seemed confusing: the “southeast-High” has a high in the “northwest”? The paper needs some further proof-reading and language editing. Examples: “popular” instead of “frequent.” Line 395-397 is not clear. “frequently attacks the basin” is a bit dramatic.

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2015-710, 2016.

Printer-friendly version

Discussion paper