

Interactive comment on “Spatiotemporal variations of air pollutants (O₃, NO₂, SO₂, CO, PM₁₀, and VOCs) with land-use types” by J.-M. Yoo et al.

Anonymous Referee #1

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The paper presents a comprehensive analysis of long-term data for CNSP pollutants and Ozone alongwith a reasonable analysis for VOCs. The presentation is clear and lucid and manuscript is well within the scope of the ACP and its readers. Overall a very comprehensive and well-compiled manuscript, however before it is considered for publishing in ACP, I would like authors to consider the following points as a minor revision:

Scientific comments:

1. Since the study presents an outlook on Ozone control strategy in South Korea, it would be reasonable to also mention what are the standards of Ozone set by the Korean govt. and are the current levels already exceeding those standards?

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2. Please be more clear on why were the data points converted to gridded data- mention the need to grid the data into 0.1 deg and 0.25 deg. This has to be especially justified because in this study no grid to grid comparison has been made with any other similar dataset, say a model output or satellite data of pollutant concentrations. Also, during the gridding no interpolation has been made in the interior points of the study area (which is often the purpose of gridding a dataset- to fill up missing points). Therefore this has to be justified strongly (for example- two stations might have been very close to each other and how gridding will remove bias, etc.)

3. Line no. 10 page no. 16998: “These results suggest that the meteorological conditions....level of pollutants”- be more clear on this. What do you exactly mean by the “seasonality” and “level” of pollutants and how are they different? Elaborate.

4. While gridding the datasets, which interpolation method was used? (for example- bilinear interpolation, etc) and why was it chosen over other methods?

5. The idea of ranking the pollutant with respect to land-use is interesting.

6. Line no. 9 page no. 17003, “The NO₂ wintertime maxima could be associated with fossil fuel consumption and photochemical oxidation of NO to NO₂”. Why not also due to lower PBL height during winter?

7. The method used to verify the 4 land use categories (Residence, Commerce, Industry and Greenbelt) using MODIS and AVHRR satellite products (and the results produced in Figure 3) is very interesting and has to be appreciated.

Grammatical/Language corrections:

1. Please remove “respectively” in line no. 14 page no. 16987 (abstract), as it is unnecessary.

2. Remove “over” in line no. 24 page no. 16989

3. In line no. 2 page no. 16996, please mention the table no. in “In the table”.

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4. Line no. 27 page no. 16998, correct the units of PM10.
5. Line no. 5 page no. 17005, “..the local part related with the background..”. Double-check with grammar.
6. Line no. 20 page no. 17011 “and, therefore, thus the VOC..”. Please remove either “therefore” or “thus”.
7. Line no. 16 page no. 17014 “The weekly cycles of the ratio were almost negligible except for several stations.” Correct grammar here. Use something like “except for some stations”. It cannot be “almost negligible” if it is not negligible in “several” stations.
8. Line no. 29 page no. 17014, correct “Jin at al.” to “Jin et al.”
9. Line no. 24 page no. 17016 correct “..was more pronounced in the layer of the planetary boundary layer (PBL)” to “...was more pronounced in the planetary boundary layer (PBL)”
10. Avoid using redundant statements in the conclusions section. For example in line no. 11 page 17018

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