

Atmos. Chem. Phys. Discuss., referee comment RC1  
<https://doi.org/10.5194/acp-2022-388-RC1>, 2022  
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## **Comment on acp-2022-388**

Anonymous Referee #1

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Referee comment on "Fluxes, patterns and sources of phosphorus deposition in an urban–rural transition region in Southwest China" by Yuanyuan Chen et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2022-388-RC1>, 2022

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This study measured atmospheric phosphorus deposition in rural-urban gradient for two years in China, and identified the contributing factor including meteorological parameters and land use. This study shows the temporal and spatial patterns of wet and dry deposition and the general patterns using adequate data. I believe that the manuscript is accepted after the modifications commented by the reviewer.

### **Source/sink (L311-315; L346-357; L388-389)**

A negative correlation between P deposition and country road/forest does not always indicate "sink" land use for P deposition. Because P deposition can be derived from soil particles containing P, a negative correlation indicates lower levels of P sources for P deposition in road and forest than in other land use such as agricultural areas. Although land-use of agriculture is intensive "source" for P deposition, the use of "sink" is carefully modified.

### **Minor comments**

L13 phosphorus (P) à P

L19 76.13 à 76.1

L45 I don't think that the term "in-situ" is needed in this manuscript. (also L85, L378)

L51 What is "so caused"?

L73 "different" P-containing aerosols: What "different"?

L102 Please clarify how to calculate the total area.

L125 Please provide how many samples for wet deposition were collected.

L144 P types: What "types"?

L162 Please add the replication protocol in section 2.2 sample collection and analysis.

L173 no data in February 2015 in Figure 2.

L179 25.0% to 99.7 % would be preferable.

L179 delete "generally"

L184 Please define which months are categorized as summer.

L191 I could not understand "three types of depositions".

L194 R=574: probably R=0.574

L218 I could not understand "during almost the whole year".

L232 1.42-3.11 times higher: suggest "xx degree higher". Because temperature is also expressed as kelvin in addition to the degree.

L233-235 The effect of temperature is not adequately discussed and supported. Huang et al (2011) referred to in this study deal with sediment, not the atmosphere.

L237-249 Is there any possibility that P fertilizer was intensively emitted into the air in autumn, which enhances dry P deposition in autumn?

L252 What deposition?

L263 What is "construction"?

L298 Ling et al. (2022) is not listed in the reference list

L298 I could not understand "this discrepancy". What differs, although P deposition is higher in agro-facility than in rural, urban, and forested areas, which seems similar to your study?

L323 I could not understand "light".

L335 The correlation seems higher in August.

L358-375 I think the section of 4.5 Management practice of regional P showing surface water quality is not needed. While adequate data regarding P deposition is shown, the data on surface water quality is marginal.