

Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2020-1249

Anonymous Referee #3

Referee comment on "Seasonal variation in atmospheric pollutants transport in central Chile: dynamics and consequences" by Rémy Lapere et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2020-1249-RC1>, 2021

General comments

This study is good, and it has a large amount of work. However, it is not suitable for been published in Atmospheric Chemistry and Physics. This investigation presents limited information for a short-studied period, and the novelty of its methodology is not clear.

The manuscript does not have the quality for been published in ACP neither. It is not easy to read in almost all sections. For example, the methodology section has many results, and the results section has extensive discussions. Indeed, results, conclusion and perspectives are not clear neither.

The document is also confusing describing the studied areas. It mentioned cities/towns that someone who does not know much about Santiago geography will not understand. I am not sure if the authors refer to the Santiago Metropolitan area and Central Chile as the same place.

In my opinion, the authors developed a proper local scientific investigation for a specific period that needs to be improved to be published in this journal.

Specific comments

Abstract

This section is confusing. The objective is not clear, and the need to develop this study wasn't shown. Results, conclusions, and perspectives are not clear. I suggest you make a better distinction between them.

Line 3. This statement is not relevant to this air pollutant study.

Line 11. I suggest to re-write '4o north and 4o south'.

Line 15. What is a bubble formation mechanism? Although the word 'bubble' is mentioned in the manuscript, this mechanism is not explained.

Introduction

Line 27- Here, I suggest specifying the Region's name and cite the demographic information source. Chile has a Regional administrative division, and none of its regions has more than 8 million inhabitants. Do the authors refer to Central Chile area?

Line 30 – I suggest moving the citation at the end of the sentence.

Line 31. I suggest creating a new paragraph from "Tropospheric O3

Line 37-38. The last sentence needs a reference.

Line 46 to 48. I agree with this sentence. However, there is not a lack of information about air long-transport sources in Central Chile. Few studies show that Santiago has been reached by at least two long-transport sources: copper smelter and coastal air pollution. Some of these studies are:

Barraza et al. 2017 (previously mentioned)

Jorquera and Barraza 2012, *Sci. Total Environ.*, 435–436, 418–429.

Moreno et al., 2010. *J. AirWaste Manage.*, 60, 1410–1421.

Kavouras et al., 2001. *J. Air Waste Manag.*, 51, 451–464, 2001.

Gallardo et al., 2002. *Atmos. Environ.*, 36, 3829–3841, 2002.

Hedberg et al., 2005. *Atmos. Environ.*, 39, 549–561.

Data and Methods

Section 2.2. This section has several sentences with i) robustness of the results from the resolved model, ii) authors interpretation of used data, and iii) discussion. All this information is mixed with some input setting. I suggest making a difference between the methodology, outcomes, and data interpretation. Maybe adding a new sub-section “modelling results” would clarify the methodology used, results and interpretations.

Line 92. I suggest you change the acronym to black carbon. It is the first-time using BC.

Line 95. Here I suggest checking the name of the Region. Chile has a Regional administrative division, and none of its regions is named Region of Santiago. Do the authors refer to Santiago city or Metropolitan Region?

Line 111. The sentence “the model is a little too dry” is relatively informal, and it does not sound like a technical interpretation or scientific information.

Figure 1. I suggest changing BC to Black carbon (BC). It is the first-time using BC.

Figure 2. in my opinion, this is an interpretation of the results and not a methodology. I suggest mentioning this figure in the results section.

Results

This section has a large amount of discussion. I suggest moving these sentences to the discussion section.

Lines 152 to 165. Is this paragraph showing results of this study? This looks more like a description of the studied area, which will better suit the methodology section.

Lines 195 to 197. This sentence needs a reference.

Line 197. I suggest changing "Andes cordillera" to "Andes mountains" (English) or "Cordillera de los Andes" (Spanish). It is better not to mix both languages.

Line 188. I understand that San Gabriel is a Mountain town and not a village. I suggest adding the altitude of both mentioned places.

Line 198. I suggest changing "ocean coast west" to "Central Chile coast at XXX km west from Santiago."

- In my opinion, it is better to use the Andes instead of Cordillera (this is a Spanish word maybe not well known to an English audience)

Line 280. If the authors add coordinates to Melipilla site, I suggest adding coordinates to the other places mentioned. As examples, Rancagua and San Fernando are not presenting coordinates (both previously mentioned in line 279).

Line 303. I suggest changing "center Santiago" to "Center of Santiago" or "Santiago Center."

Line 313 to 315. This sentence is confusing, in particular when the authors mentioned opposite ideas, such as "increase (decrease, respectively), and western (eastern, respectively).

- In my opinion, it is better to use the Andes instead of Andes Cordillera (this is a Spanish word maybe not well known to an English audience)

Discussion

This section looks like a continuation or a summary of the previous section. Result section has a lot of discussions; my suggestions are to combine both sections or remove the discussion from the results section.

Line 395 to 401. I can't entirely agree with this paragraph—the information presented in the current manuscript is not enough to support the next sentence "the result presented can be extrapolated ... ", mainly due to the short period studied.

Conclusion

This section clear.

Line 449. This sentence sounds confusing: "East (the west, respectively) ".