

Interactive comment on “An emission inventory of sulfur from anthropogenic sources in Antarctica” by S. V. Shirsat and H. F. Graf

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This paper presents an inventory of anthropogenic sulfur emissions in Antarctica. To my knowledge, this is the first more or less complete inventory available for Antarctica. Although emissions there are relatively low when compared to emissions elsewhere, they are still important to consider when the pristine conditions of Antarctica are to be preserved. Thus, the work is of relevance.

The authors are to be applauded for their efforts in compiling all the information necessary. Much of the information used is probably classical (fuel use statistics, etc.) but they also used innovative methods (e.g., information from philatelists on ship routes). The methods all appear sound and I think the paper should be published largely as it is in ACP - however, I would suggest two changes and have one request:

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1) The inventory was done only for SO₂ but the authors have all information needed to produce an inventory also for other species and I suspect they have already done this, since they mention that the purpose of the inventory is to use it for chemistry modeling. I suggest that the authors add information also on other species (e.g., NO_x, CO, BC at least). I do not suggest that all figures, etc., are produced for these species, too, but it would be good to see the total numbers (probably split per source category).

2) At the end, I think a table summarizing the work is missing. This should list total emissions for Antarctica, split by source category. This is the main result of the work but it somehow gets lost at the end. In the same table probably global emissions could be listed as well for comparison purposes.

3) I would encourage the authors to make their inventory available and add information in the paper where and how it can be obtained. It would be particularly helpful if the authors could feed their work into ongoing efforts to establish emission inventories (e.g., EDGAR) or at least make their inventory available in a format such that it can be combined with one of the global inventories (e.g., information on a latitude/longitude grid).

Other comments:

Page 1909, line 9: When mentioning Kola Peninsula, Norilsk should probably mentioned, too, since it is located at a similar latitude but is a larger source of SO₂ than Kola.

Page 1911, line 12-13: when mentioning concentrations of NSS-sulphate and methanesulfonate from Minikin (1998), numbers should be reversed. Currently the listing would suggest that methanesulfonate concentrations are greater than NSS-sulphate concentrations but it should actually be just the other way round.

Table 1 has double entries (rows 1-5 and 6-10 are identical).

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On pages 1914-1915, it is not entirely clear to me why an extrapolation from the Casey station to other stations is needed if fuel use information is available for all stations. Or is this information only available for all stations of a nation combined?

Language:

Page 1911, line 25: "to investigate atmospheric concentration and surface deposition": concentration of what? do you mean atmospheric chemical composition?

Page 1912, line 6: "sources whose information is not obtainable" -> sources for which information is not obtainable

Page 1921, line 19: "the global aircraft in Antarctica" - remove the word "the global"

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 1907, 2009.

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