

Interactive comment on “The complex origin and spatial distribution of non-pure sulfate particles (NSPs) in the stratosphere” by Jean-Baptiste Renard et al.

Anonymous Referee #2

Received and published: 13 March 2020

The complex origin and spatial distribution of non-pure sulfate particles (NSPs) in the stratosphere, by Jean-Baptiste Renard et al. gives an overview of the literature on stratospheric aerosol. With more than 100 cited papers a lot of diverse information about stratospheric particles is compiled. In this "review"-part (chapter 1,2,4,5) specific results from diverse papers are mixed together to present an overall picture. But in some cases this presented overall picture is inaccurate as not all presented results can be mixed in reality because of a complete different data base in the cited papers (e.g. particle composition of small carbonaceous particles presented by Ebert et al., 2016 on the one hand and Schütze et al., 2017 on the other hand. They describe completely different particles, which cannot be merged). One conclusion of this manuscript is that

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data on NSP in the stratosphere is limited and very heterogeneous in dependence of different variables (time, location, height etc.). This is true but this problem cannot be solved by the merge of individual published observations from different locations as presented in this manuscript.

Following the cited papers it is obvious how difficult it is to receive evidences (e.g. a link of specific source of NSP to a specific particle size or chemical species). Nevertheless, in this manuscript sometimes the "best guess" is presented as new finding.

In chapter 3,6 and 7 new data (LOAC) from balloon measurements are presented (sections 3, 6, 7). This data is presented very shortly and it is not really embedded in the review part. It is mentioned that 135 flights were carried out, but in Figure 1-7 the results of only 3 flights are shown. No details about these measurements are given (error sources, artefact discussion, data interpretation), no quantitative data at all (data tables of original data or deduced values)), nor detailed discussion in which way the data is linked to specific questions (beside qualitative speculations). I was looking forward for the data of NSP from 135 balloon flights. But there is no quantitative new data presented in the manuscript. If the manuscript should be more than a pure literature review, more details and discussion to the LOAC data has to be presented and this part must be harmonized with the review part.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-904>, 2019.

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