

Interactive comment on “Sulfur dioxide (SO₂) from MIPAS in the upper troposphere and lower stratosphere 2002–2012” by M. Höpfner et al.

Anonymous Referee #1

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This paper by Höpfner et al. presents SO₂ retrieval data from MIPAS with the following characteristics:

- UTLS only (10-20 km)
- retrieval on a single observation basis
- 2002-2012 time period
- reasonable agreement between the two MIPAS operation modes (after debiasing)
- no large discrepancies with ACE-FTS data (after debiasing)

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After presentation of the retrieval algorithm, the data is analyzed for major volcanic eruptions which occurred in the reported time period; and a short analysis is presented of the global background variability.

There is very little to fault the manuscript. The science is solid, results are presented in a clear and balanced way and the manuscript is well written. In addition, derived volcanic data is very useful reference data; especially with respect to the atmospheric lifetime of SO₂ which is not often reported in the literature. The background analysis as well reveals interesting and unknown patterns, where future research can be build upon.

The only change I would request prior to publication is that the authors explain in (some) detail the calculation of total masses/columns. Since the daily spatial coverage is very sparse, it is not clear how reliable daily masses are calculated for large volcanic plumes.

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