

Interactive
Comment

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

M. Höpfner et al.

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We thank referee 1 for the valuable comments regarding clarification of the calculation of total masses for SO₂. Below we address the comment which is quoted in bold face.

a) 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.

As an explanation we have added the following text. (Mind also that for the calculation

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of masses from which the entries of Tab. 3 are derived, we have used mean values over five days to obtain a better coverage - as already mentioned in the text.)

‘For the calculation of masses, the MIPAS retrievals of SO₂ volume mixing ratios have been combined with the pressure-temperature dataset also derived from MIPAS (von Clarmann et al., 2003) to obtain vertical profiles of number densities. These profiles have been integrated in the vertical over the respective layer thickness to obtain partial column amounts. Subsequently, these data have been integrated over 10deg latitude bins to obtain zonal masses of SO₂. For this integration the profiles have been assumed to be equally distributed within each latitude band.’

References

von Clarmann, T., Glatthor, N., Grabowski, U., Höpfner, M., Kellmann, S., Kiefer, M., Linden, A., Mengistu Tsidu, G., Milz, M., Steck, T., Stiller, G. P., Wang, D. Y., Fischer, H., Funke, B., Gil-López, S., and López-Puertas, M.: Retrieval of temperature and tangent altitude pointing from limb emission spectra recorded from space by the Michelson Interferometer for Passive Atmospheric Sounding (MIPAS), *J. Geophys. Res.*, 108, 4736, doi:10.1029/2003JD003602, 2003.

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