Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2017-987-SC2, 2017

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Quantification of sulfur deposition changes under sulfate geoengineering conditions" *by* Daniele Visioni et al.

g. visconti

guido.visconti@aquila.infn.it

Received and published: 27 November 2017

This paper as most of modeling papers neglects the experimental data. I would require the authors to make a comparison of their baseline results (without the SO2 injection) with the available data as done for example in the Vet et al (2014) paper. (see Figure 1 bottom) They should also produce a figure for the baseline deposition results so that the effects of the injection could be compared with absolute values. As a matter of fact Kravitz et al (2010) paper shows for a 2.5 Mt S injection a deposition which is comparable to the present observed acid deposition in regions of EuropeAsia and North America. (se attached Figure 1). The suspicion is that this paper has similar results (increase in areas deposition rate up to 15%).

If this is so it means that injecting sulfur in the stratosphere would produce an acid deposition similar or greater to the present one especially for the envisioned large injection rates at the end of the century (Kravitz et al 2017).

By the way they refer always to Kravitz et al 2009 paper ignoring the correction to the same paper (Kravitz et al 2010)

If they really want to show the effects of QBO they could make this comparison with the QBO on and off in their model and again make a comparison with experimental data.

Beside this question of QBO is quite peculiar. QBO (like AO or PDO) should be an intrinsic feature of any general circulation model and not introduced with a specific routine in the model. The authors should explain such characteristic.

References

Kravitz, B., Robock, A., Oman, L., Stenchinov, G., and A. Marquardt, (2010) Correction to "Sulfuric acid deposition from stratospheric geoengineering with sulfate aerosols", J. Ge-ophys. Res., 115, D16119, doi: 10.1029/2010JD014579

Kravitz, B, MacMartin, D.G., Mills, M.J., Richter, J.H., Tilmes, S., Lamarque, J. , Trib-bia, J.F. and F. Vitt, (2017), First simulations of designing stratospheric sulfate aerosol geoen-gineering to meet multiple simultaneous climate objectives, J. Geophys. Res., in the press

Vet, R. et al. (2014) A global assessment of precipitation chemistry and deposition of sulfur, nitrogen, sea salt, base cations, organic acids, acidity and pH, and phosphorus, Atmos-pheric Environment, 93, 3-100, doi.org/10.1016/j.atmosenv.2013.10.060

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2017-987, 2017.

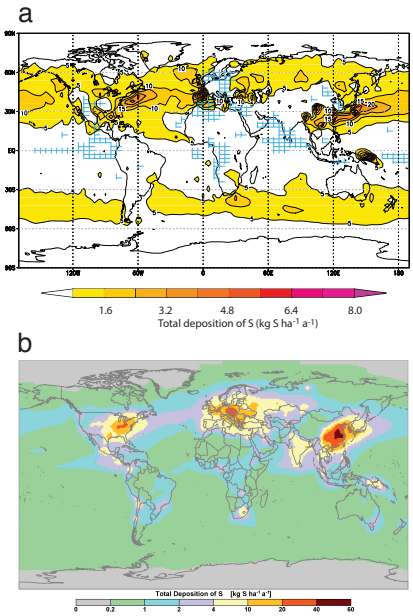

Figure 1

Fig. 1.