Author response to Interactive Comment by M. J. Tang
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Interactive comment on "Solar geoengineering using solid aerosol in the stratosphere" by D. K. Weisenstein and D. W. Keith

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This study is quite novel and interesting for the SRM research community. Congratulations.

In the manuscript it is stated that important reactions on the surface of these solid SRM particles are not studied. May I bring your attention to the laboratory measurements funded by the UK SPICE project? We have investigated the heterogeneous reactions of these SRM particles (mainly TiO_2, but also SiO_2 and other solid particles) with N_2O_5, $ClONO_2$, and O_3.

The work on N_2O_5 was published recently (Tang et al., 2014a; Tang et al., 2014b), and the effect of heterogeneous reactions of N_2O_5 with TiO_2 particles on ozone was also assessed using a 3-D global model (Tang et al., 2014a). Our work on $ClONO_2$ and O_3 will be submitted soon.

Reference:

Tang, M. J., Telford, P. J., Pope, F. D., Rkiouak, L., Abraham, N. L., Archibald, A. T., Braesicke, P., Pyle, J. A., McGregor, J., Watson, I. M., Cox, R. A., and Kalberer, M.: Heterogeneous reaction of N_2O_5 with airborne TiO_2 particles and its implication for stratospheric particle injection, Atmos. Chem. Phys., 14, 6035-6048, 2014a.

Tang, M. J., Camp, J. C. J., Rkiouak, L., McGregor, J., Watson, I. M., Cox, R. A., Kalberer, M., Ward, A. D., and Pope, F. D.: Heterogeneous Interaction of SiO2 with N_2O_5: Aerosol Flow Tube and Single Particle Optical Levitation-Raman Spectroscopy Studies, J. Phys. Chem. A, 118, 8817-8827, 2014.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 11799, 2015.

We thank M. J. Tang for reading and commenting on our manuscript. We are aware of the works mentioned and appreciate their significance. Because these studies are not directly applicable, as neither alumina nor diamond were tested, we did not cite them in the initial manuscript. However, they are applicable to the topic in general and a valuable reference in this developing field, so we have added a citation to these studies in the introduction. And we replaced the

statement that “rates of important chemical reactions remain unmeasured” with “the rates of many potentially important chemical reactions remain unmeasured”.

Now the 7th paragraph of the introduction reads, in part:

“The use of solid aerosols, however, introduces new risks that require evaluation. The dry surfaces of the solid aerosols, for example, may catalyze reactions that cause ozone loss (Tang et al., 2014a; 2014b). This risk is hard to evaluate because the rates of many potentially important chemical reactions remain unmeasured for substances such as diamond that are novel in the stratosphere.”