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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Long range transport and fate of a stratospheric volcanic cloud from Soufriere Hills volcano, Montserrat" *by* A. J. Prata et al.

A. J. Prata et al.

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Response to Referee #3

1. Geo-engineering. We do not endorse this idea and we do not take any position on it in our paper. It was mentioned because if ideas like this are to be considered then our measurements of stratospheric S will be useful for demonstrating the complexities of the climate response–as a natural analog (just as was done in the *Nuclear Winter* debate). The observations are not justified on these grounds. Nowhere in the paper is such a statement made nor implied. Rather we state that our measurements are useful for assessing the effects of volcanoes on cli-

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mate. Our paper is not about the debate on geo-engineering–it is concerned with accurately measuring stratospheric SO_2 using satellite instruments.

2. Movie files. We agree that the movies should have been portrayed on the same projection and we are very happy to make this change. However, it was not our intention to assess model *vs.* observational differences. FLEXPART was used as an example of a state-of-the-science dispersion model to verify that the OMI, AIRS and SEVIRI satellite measurements (which contain no height information) were indeed observing stratospheric SO_2. CALIPSO lidar measurements confirm this too. We do make the observation that FLEXPART moves the cloud too far north compared to the observations. We are happy to include more discussion on this aspect of the paper as we agree with the Referee that this has value.

Specific comments.

1. (4659/13) This should read 7.4–10.5 Tg(S) per year.
2. (4666/9) The Douglass and Knox (2005) paper was referred to simply because it discussed the relationship between AOD and volcano climate forcing. We suppose the Hansen et al. (1992) paper would do just as well.
3. (4666/17–18) We are **not** discussing geo-engineering in this paper. We are concerned with the climate's transient response to the Soufrière Hills SO_2 stratospheric injection. We conclude it is negligible.

Technical

1. (4658/8) Accent grave will be added to the spelling of Soufrière.

ACPD
7, S2109–S2111, 2007

EGU

2. (4668) Accent will be added to the spelling of El Chichón.

3. (4668) Alphabetical order of Rosenfeld and Tupper references will be corrected.

4. The links to the movies and the fact they they were zipped files is beyond our control. This is the way the Journal deals with the media files. We actually sent un-zipped files. We will pass this valuable feedback to the Journal.

References

Hansen, J., A. Lacsis, R. Ruedy, and M. Sato (2002) Potential climate impact of Mount Pinatubo eruption, *Geophys. Res. Lett.*, **19**(2), 215–218.

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7, S2109–S2111, 2007