Brühl et al. utilize a chemistry-climate model to calculate the overall radiative forcing of atmospheric COS. The model shows good agreement with observations of (the very limited) COS concentrations, sulfate aerosol concentrations, and aerosol extinction in the troposphere and stratosphere. They conclude that COS provides the majority (70%) of the sulfur that contributes to the sulfate aerosol layer in the stratosphere during volcanically quiescent times, and that transport of SO_2 from the troposphere into the stratosphere is negligible. They conclude that COS exerts a negligible radiative forcing, as the positive (direct) forcing is cancelled out by the negative (indirect) forcing.

The paper is scientifically sound, and so I only have some relatively minor grammatical corrections, as well as some suggestions on places where the authors should elaborate.

Abstract: I suggest using the word direct and indirect to describe the radiative forcing by COS and from H_2SO_4 derived from oxidation of COS, respectively. For example, in the abstract, say ñwe compute that the *direct* radiative forcingò and ñThe *direct* global warming potentialsò and ñtwo times the *direct* warming forcing of COSò. I think this will improve clarity.

Introduction: Elaborate more on what QBO is and how it can influence stratospheric chemical composition.

Page 3: replace ñby sulphatesò with ñof sulphatesò

Page 3: replace ñOn shorter timescales volcanoes can be important.ò with ñOn shorter timescales volcanoes can be an important contributor to tropospheric and stratospheric aerosol loadings.ò

Page 3: add ñwhere they are deposited to the surface on the timescale of ~1 weekò after ñwere transported back into the troposphereò.

Page 4: replace ñby anthropogenicò with ñfrom anthropogenicò

Page 4: Insert ñmostò between ñthe thirdò and ñabundantò

Page 4: is 7.7% a dry mass fraction?

Page 4: Add ñsuch as DMSò after ñsupersaturated with sulphur containing gasesò

Page 4: Doesnôt sulfate play the largest role in nourishing the biosphere, not COS? I know that COS is more abundant, but it is sulfate that is important here.

Page 4: Provide a reference for the observations of CS_2.

Page 5: Provide a reference for your statement about the importance of lightning in fires.

Page 5: replace ñadditionally producesò with ñalso produceò

Page 5: replace ñalso COS as increased by anthropogenic activityò with ñCOS has also increased due to anthropogenic activityò

Page 5: Awkward sentence about the balanced budget. Do you mean to say ñThe budget is balanced with in the large uncertainty of the source and sink estimates.ò?

Page 6: replace ñas governedò with ñand is governedò

Page 7: add ñsizeò between ñlognormalò and ñdistributionsò

Page 7: ñtransfer to smaller modesò via evaporation?

Page 9: 0.48-0.4 ppbv. Are you missing a significant figure?

Page 9: Elaborate on Figure 1. Why are SH values higher than NH? Why do the highest values occur in the low latitudes?

Page 9: add ñseasonò after ñmonsoonò

Page 10: replace ñFigure 2 shows the productionò with ñFigure 2 shows the production rateò

Page 10: What is ñanorganicò? Do you mean to say ñinorganicò. Define ñinorganicò and ñSOxò

Page 11: add ñwithò between ñtogetherò and ñaerosolò

Page 11: ñSulphate aerosol thus explains on average 70% of the observations.ò Sulphate aerosol from COS? Observations of sulfate aerosol concentration?

Page 11: In what chemical form is sulphur in the gas phase? SO_2?

Page 11: How much does dust contribute?

Page 12: replace ñto reachò with ñfrom reachingò

Page 12: change last sentence of section 3 to ñthat about 70% of the stratospheric sulphate layer in volcanically quiescent periods is controlled by the oxidation of COSò.

Page 14: change ñradiation, also becauseò to ñradiation, becauseò

Page 14: change ñparticles would be even larger notably > 2 µm, they absorbò to ñparticles were even larger notably > 2 µm, they would absorbò

Figure 1 caption: Do you mean pptv, not ppbv?

Figure 2 caption: Define SOx.

Figure 3 caption and in text: Where does organic carbon come from? Oxidation of COS? Itôs not entirely clear why you are showing this.

Figures 3 and 4 should be combined into one to make it easier to compare.

Figure 5: Label contours on plot.

Figure 9: The average total cloud cover at what level in the atmosphere?