

Dear Dr Kukui et al.,

Thank you for addressing most of the reviewers' comments. I believe your paper provides useful and novel information on H₂SO₄ budget in a remote coastal environment and can be published after addressing the reviewer's #3 question.

Although I understand you have some concerns regarding '*overloading the article without adding new information*' when responding to the comment below to the reviewer #3, I feel the reviewer raised a very important point here. I suggest to address this point either by expanding your calculations using both $k(\text{OH}+\text{SO}_2)$, as stated below, or expand your discussion section, supporting the rationale for your choice, in the text, so it is clear to your article reader.

Comment from Reviewer #3 (and authors' response) :

I'm struggling a bit with the used $k(\text{OH}+\text{SO}_2)$ from the IUPAC 2004 recommendation. The more recent value by Blitz et al., 2017, 10.1021/acs.jpca.7b01295, is clearly smaller. Consequently, also the H₂SO₄ production from this channel will become smaller worsening the good agreement between measurement and calculation at daytime. But, a better agreement with any calculations is not an argument for a special parameter. So, it would be fine, if the authors could discuss the results based on both $k(\text{OH}+\text{SO}_2)$'s more in detail, not only very briefly as in paragraph 4.2.

Our choice of the $k(\text{OH}+\text{SO}_2)$ reaction coefficient is based on the latest IUPAC and JPL recommendations, as it is explained at the beginning of Section 4.2. We also discuss in quantitative terms what would be the impact on our conclusions of using recently suggested lower rate coefficient. This impact is straightforward, as the yield of H₂SO₄ from the reaction of OH+SO₂ is linearly proportional to the reaction coefficient $k(\text{OH}+\text{SO}_2)$. We find that comparison of calculations using different rate constants would significantly overload the article without adding new information.

Kind regards,

Ivan Kourtchev