

Reply to editor comments

Dear editor,

Thank you for your positive feedback and for recommending our manuscript for publication subject to minor revisions. We appreciate the constructive comments from the reviewers and have carefully addressed their concerns. Below, we outline the specific changes made in response to the remaining points.

Best regards,

Mingzhao Liu

Response

Concerning Referee #1's comment on line 212 of the original manuscript, I interpret the referee's meaning to be that this statement should be rephrased to remove the text "lose the ability". The model does not change, it is a static thing, so it cannot gain or lose abilities while running. If a model is inaccurate, then such inaccuracies may become more apparent as a simulation progresses, or under certain situations (e.g., certain areas in parameter space). Your statement should be made more precise here.

We agree with the reviewer's observation that the phrase "lose the ability" is not appropriate for describing a static model. To address this, we have rephrased the statement to more accurately reflect the behavior of the model. The revised text now reads:

"The accuracy of the model results in reproducing the structural features of the observed SO₂ distributions gradually decreases after 15 days of simulation time due to error propagation."

Concerning Refree #2's comment regarding line 259 of the original manuscript, in your edit, please be clearer about the location of Raikoke – it cannot be in both the mid- AND high-latitudes. Also, please be careful with grammar regarding volcanoes vs. eruptions, e.g., here, Ambae is a tropical volcano, not eruption. I might suggest text here similar to: "Ambae is situated in the tropics while Raikoke is in the mid-latitudes..."

We thank the reviewer for pointing out the need for greater precision regarding the location of Raikoke and the distinction between volcanoes and eruptions. We have revised the text as follows:

"Ambae is situated in the tropics and Raikoke is located in the mid-latitudes."