

The paper addresses an interesting issue relevant with the impact of volcanic eruptions on the isoprene emissions. It is an impact that can be inferred due to the changes in the solar radiation during and after volcanic eruptions. The paper is interesting and offers an added value in the scientific literature relevant to the estimation of the natural emissions. It introduces an issue that has not been thoroughly investigated and will have to be accounted for while calculating natural emissions.

However, in order the paper to be published the following questions/comments need to be answered or discussed:

1) It would be interesting to perform new calculations taking into consideration the changes that the dusty atmosphere introduces not only in the solar radiation but in the temperature too. Please try at least to discuss the issue.

We can extend our analyses to look at the interaction effects of small changes in temperature as requested.

2) What are the expected differences in the global or regional isoprene emissions due to the new parameterization that accounts for the dusty atmosphere due to volcanic eruptions? To show this, it would be interesting to perform additional calculations at many different latitudes and longitudes covering a region or a continent.

We are limited in undertaking global/regional calculations because of the availability of suitable Idiff and Idir datasets. For case 2, which is the more interesting case, it is only possible to do calculations at the same latitude that Gu et al's measurements were made at since we use equations derived from their experimental results and those would not be applicable to other latitudes.

3) The paper should include a section showing validation results. The results of the present study, do they compare better with measurements than any previously existing estimated dataset?

As explained in response to referee 1, our approach is theoretical because there are no observations (that we know of) of how isoprene emissions respond to change in Idiff and Idir. Our MS is the first time (again to our knowledge) that anyone has drawn attention to this possibility. It is hoped that our theoretical treatment will highlight awareness of the issue and stimulate further modelling analyses, field campaigns and laboratory studies to investigate this issue further.

4) Which are the uncertainties introduced in the estimation of isoprene emissions if the impact of the dusty atmosphere due to volcanic eruption is accounted for? How these uncertainties compare with the existing known ones?

It is not clear to us what the reviewer is driving at here.

5) The paper investigates the impact of the dusty atmosphere due to volcanic eruptions on the isoprene emissions. Would it be possible to make a short discussion on how the aerosol loading in the atmosphere due to reasons other than volcanic eruptions could have an influence on isoprene emissions?

We can include a paragraph on other natural and anthropogenic events that might change the quality of solar radiation reaching the Earth's surface.