

Dear Dr. Ma,

We would like to thank you for accepting the article to be published in ACP. The authors agree, that the review process was really helpful and did indeed improve the manuscript a lot. We would also like to thank you for reading our revised manuscript carefully and for providing further comments which we address below. We are convinced that we were able to address all comments and questions and that the revised manuscript is now adequate for publication in ACP.

In the following, we reproduced the comments (in black) together with our responses (in red).

With very best regards,
Jonas Gliß

Response to the Editor report

Dear Jonas Gliß,

Your manuscript has improved a lot, thanks to the several rounds of substantial discussions, especially helpful comments and suggestions from the referees. The manuscript can be accepted for publication in ACP subject to some technical corrections as described below.

It seems that the instrument was not inside the plume all the way during the experiment.

Answer: It is true, that not all measurements were performed in the plume, however, we wish to remark that still the focus of the study is on the volcanic plume data. We nonetheless followed the editor's suggestions and only changed the wording slightly as given below and we hope, the editor can agree with this.

Therefore, the two sentences in Line 2-4 and Line 43-44 might be rewritten, respectively, as "Spatial and temporal profiles of chlorine dioxide (OCIO), bromine monoxide (BrO) and sulfur dioxide (SO₂) in the volcanic plume were investigated at Mt. Etna, Italy, in September 2012 using Multi-Axis-Differential-Optical-Absorption-Spectroscopy (MAX-DOAS)";

Changes to the manuscript: we changed the corresponding sentence to read:

"Spatial and temporal profiles of chlorine dioxide (OCIO), bromine monoxide (BrO) and sulfur dioxide (SO₂) of the volcanic plume at Mt. Etna, Italy, were investigated in September 2012 using Multi Axis Differential Optical Absorption Spectroscopy (MAX-DOAS)"

"In this study we present MAX-DOAS measurements (e.g. Hönninger et al., 2004) of the volcanic plumes performed at Mt. Etna on Sicily, Italy".

Changes to the manuscript: we changed the corresponding sentence to read:

"In this study we present MAX-DOAS measurements (e.g. Hönninger et al., 2004) of the volcanic plume at Mt. Etna on Sicily, Italy, performed in September 2012."

Please check if the serial numbers of the reaction coefficients are written correctly. For example,

Line 151: k₈ => k₇;

Line 373: k₁ => k₇;

Lines 679-680 and Eqs. (5)-(9) in Page 28: k₁₀ => k₉, k₁₁ => k₁₀?

Typos? Lines 481, 579 and 855: were => where ?

Answer and changes to the manuscript: We would like to thank the editor for these attentive hints. All suggested changes were made in the revised manuscript.

Further changes

We want to remark, that we added the following sentence in the Acknowledgements to acknowledge the helpful input of the editor and the referees during the review process:
“Furthermore, we wish to thank the Editor Dr. Ma and three anonymous referees for their comments and helpful suggestions during the review process.”