



Interactive comment on “First experimental evidence for the CO₂-driven origin of Stromboli’s major explosions” by A. Aiuppa et al.

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Authors’ reply to Interactive comment on “First experimental evidence for the CO₂-driven origin of Stromboli’s major explosions” by A. Aiuppa et al. Anonymous Referee #1

Reviewer’s comment: As mentioned above, a large error (40%) is associated with the data presented in the paper. This is probably due to a small number of CO₂/SO₂ devices and SO₂ UV scanners deployed around the crater/volcano. Probably, indicating the prevailing direction(s) of local winds would help defining where to improve the monitoring networks. Considering the large distance between the craters and the UV scanning DOAS spectrometers, did the Authors consider the time shift between the moment when the gas exits the craters and the moment when it is really measured

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from a UV station in calculating the SO₂ flux and hence the corresponding CO₂ flux?

Authors' reply: Since the MultiGAS and the UV systems have different locations and different acquisition frequency, we cannot synchronise the measurements. However, we can safely calculate the daily average of the SO₂ flux and CO₂/SO₂ ratios to then obtain a daily average of the CO₂ flux. In doing so, we are sacrificing part of the temporal resolution in our measurements, but we are solving the problems raised by the Reviewer.

Reviewer's comment: When describing the trends of cumulative curves of CO₂ flux in Fig. 5, no mention is given to curve No. 3, that is the only one that does not follow the pattern of pre-explosive degassing. I think it would be necessary and interesting to have some explanation for that behaviour, inasmuch as it is coupled with a "strange" behaviour of the corresponding cumulative curve of SO₂ flux, as well.

Authors' reply: we admit that trend 3 has less obvious explanation. Still we note that the observed normalised cumulative CO₂ flux is different (lower) than expected if the average CO₂/SO₂ ratios was maintained. Thus, the involved processes are likely the same, but with a smaller volume of trapped Co₂ prior to the event. This latter is consistent with the fact that the 3rd of May 2009 eruption was short-lived and produced a relatively small volume of erupted material relative to other (more energetic) events

All the technical corrections will be easily handled upon submission of a final version of the manuscript

Interactive comment on Solid Earth Discuss., 3, 411, 2011.

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