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Comment on acp-2021-155

Ákos Horváth et al.

Author comment on "Geometric estimation of volcanic eruption column height from GOES-R near-limb imagery – Part 1: Methodology" by Ákos Horváth et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2021-155-AC1, 2021

We thank the Referees for their constructive comments. In the following, we give a point-by-point response to each of the issues raised.

Referee #1
Row 40: just a comment to say that obviously the temperature profile can be obtained not only from a numerical forecast but also, for example, from a reliable measurement such as radiosounding if available in space and time concomitance with the eruption. Since we are here in the introduction of the paper, I would give a more general explanation to the BT method.

We have modified the sentence to state that the temperature profile can be obtained from a radiosounding or a numerical forecast.

Referee #2
The only thing I would like to address is the conclusion - at the moment it seems more like a summary to me, make it more concise - focus on your scientific contribution and a relation to part 2.

We have made the Summary more concise by removing discussion not strictly pertinent to the presented methodology. We have also added a segue into Part 2.

Section 3.2. What about the case when the volcanic cloud contains a lot of "topography"? Then measuring the length from the side considered only the height of the side of the cloud.

We have added a sentence to the first paragraph of section 3.2, noting that for a significantly bumpy plume top the surface-measured shadow length leads to height underestimation, because the highest plume point might cast its shadow on the lower and wider parts of the plume itself.

Your list of references is good, but considering your geometric approach, I would suggest adding:
https://www.mdpi.com/2072-4292/11/7/785
https://www.sciencedirect.com/science/article/abs/pii/S0034425718300737

We have included the de Michele et al. (2019) and Zakšek et al. (2018) references in section 3.4, as suggested.