Dear Farahnaz Khosrawi,

Thank you for accepting our manuscript for final publication in ACP.

I appreciate your valuable comments. Please, find my answers below:

Comment 1:

P1, L20: But what is actually the best approach? Later in the manuscript you write that also EnKF does not work. Is the approach you present here the only option to treat volcanic aerosol in data assimilation or are there also other (better) options?

Reply: The LETKF method used in this work belongs to the EnKF (Ensemble Kalman Filter) family of methods. Despite the limitations of this specific method, LETKF has shown to be a promising alternative for assimilation of volcanic data. Our findings show that a significant improvement of the forecast quality can be achieved with this method. Therefore, we consider that this method actually works.

However, LETKF results in suboptimal filter performance and there is room for further improvement. In Sect. 5, we discuss potential alternative methods to be investigated in future works. Here, we suggest focussing on non-traditional EnKF variants. In particular, we mention the ensemble Kalman filtering strategy proposed by Bishop (2016) for highly skewed non-negative uncertainty distributions.

However, further work needs to be done to establish whether these alternative methods are better.

Comment 2:

P3, L56: retrievals → retrievals

Reply: We cannot see any error in this sentence. Please, could you clarify "retrievals->retrievals"?

Comments 3:

P12, Eq. 7: Please check the formula. I think a "2" in the exponent is missing to end up with the correct calculation.

Reply: Thank you for noticing this error. We have fixed it now.

Comments 4:

P13, Eq 8: Same here as for Eq. 7.

Reply: Fixed.

Comments 5:

P16, L362: "Fig." missing before "5a", "5b", "5c" and "5d".

Reply: Fixed.

Comments 6:

P20, L427: space between "LETKF" and "(sqrt)" missing.

Reply: Fixed.

Comments 7:

P20, L438: unit should be in upright fond.

Reply: Fixed.

Comments 8:

P25, L493: ......by a complex plume dynamics" → mixture of singular and plural. Chose either singular or plural.

Reply: Fixed. We removed "a". Replaced: "by a complex plume dynamics" by "by complex plume dynamics"