

Response to review by editor:

I am happy to accept your paper for final publication as a Letter in ACP subject to some relatively minor further changes:

We would like to thank the editor for his time to edit the manuscript and his positive response for publishing our research as a Letter in ACP. Below is a point by point response on his comments and suggestions.

1) Please consider the location and naming of Table 1/S1 and whether (as requested by the reviewer) it is possible to add some observational data. If you intend it to be in the appendix then please name it Table A1.

The table that includes the comparison of simulated aerosol pH against the observationally-constrained estimates has been moved to the appendix. The second referee requested to highlight any field data in Table S1 that is not influenced by the bullet points of section 4.5. While this is a good suggestion in principle, this is not feasible since every single field data has a few (or more) sources of discrepancy with the simulated pH as outlined by the listed bullet-points.

2) You are not consistent in your use of the words aerosol, aerosols and particles. In most cases the word particle would be most appropriate (particles have acidity, not the aerosol). When referring to aerosol in multiple locations then the plural is acceptable, otherwise the word aerosols is not a synonym of particles. You also use the word particulate as an adjective in the abstract where it should be a noun (particle mass).

Following the editor's recommendations, we have changed the word aerosol/aerosols to "aerosol particle acidity" and "aerosol pH" to "aerosol particle pH" throughout the manuscript.

3) The final sentence of the abstract is somewhat vague. What control strategies are you referring to in the context of climate change? The abstract up to this point has been only about pH, so it is a large leap for readers to understand the link between pH and climate, which is presumably through particle hygroscopicity and size. Rather than being a speculative statement, please try to link this sentence more to the findings described in your paper. The conclusions could also explain this link in a bit more detail so that this sentence is linked to a longer description in the paper.

We have revised the abstract and the conclusions in order to more clearly present the link between the aerosol particle acidity and climate, i.e., our findings revealed an increase in aerosol hygroscopicity following the simulated changes in aerosol particle pH.