

Interactive comment on “Further evidence of important environmental information content in red-to-green ratios as depicted in paintings by great masters” by C. S. Zerefos et al.

Anonymous Referee #1

Received and published: 26 January 2014

This paper assesses the information found in historical paintings made after volcanic eruptions during the last 5 centuries. The work is novel and innovative, but should not be over-interpreted due to (probably) high uncertainties. A somewhat more quantitative evaluation of the uncertainties would be valuable. High uncertainties, however, are an issue for many climate and chemistry reconstructions that use data from before the ‘instrumental’ era. Apart from being an ‘artful’ and beautiful paper, it would be good to go beyond art-pour-art, and highlight better what ‘new’ information was obtained from this dataset (or mainly confirming existing other datasets). I recommend the paper for publication in ACP when taking into account the following concerns outlined below.

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p. 33147 l14 excluded=>to avoid what? I think better to define year of eruption and following 3 years as 'volcanic' while the other years are non-volcanic.

p. 33147 l. 12 Mention what where the correlations, and was found in this work regarding the AOD from volcanoes during the last centuries.

p. 33147 l. 17 Indicate where these values are mainly valid. (mid-latitudes I assume)

p. 33147 l. 19-26 I would suggest to downscale this in the abstract- and use the work for a somewhat more 'scientific' sensitivity analysis. The authors use 2 (beautiful!) paintings (see Figure 10) to demonstrate the impact of dust as observed by Maestro Panayiotis Tetsis. The paintings show two sunsets. One painting shows rocks- the size of the sun is different, one painting seems to have some cloud cover, the other not. I suspect that such issues are found in most paintings assessed by the authors. Assuming that the authors only analysed the 'sky' in the paintings, can the authors assess the uncertainty associated with such 'structural' differences in the paintings (e.g. analyse parts of paintings).

p. 33148 Please explain what is meant with 'created with a color profile protocol'? I expect this related to the camera sensor and the way the digital picture is stored? A few sentences explaining the issue would be essential.

p. 33150 l. 12 In other words: the errors made previously were larger for the 'red' sunsets used to evaluate the impact of volcanoes?

p. 33151 as outlined above: I think the authors dismiss too easily the impact of structural differences, and the cancellation of errors is wishful thinking. It would be great to have some attempts to analyse such differences.

p. 33152 It would be logical to first describe the experiment as done here, and then the contrasting datasets. Somewhere the information should be given that the data is really about major volcanic eruptions where emissions reach the stratosphere, and remain for several years. This is also important since it means that datasets are probably more

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globally representative.

p. 33154 | 18 Explain why it is possible to compare the impact of mineral aerosol (in lower atmospheric layers, larger) to volcanic aerosol in terms of RGB.

p. 33157 Explain the conclusions (abstract) to what extent 'new' information came out of this study, regarding the historic impact of volcanoes in bringing sulfate into the stratosphere? Or is it mainly 'not-contradicting' other datasets.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 33145, 2013.

ACPD

13, C11523–C11525,
2014

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