

Review of '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.

General comments

This is (another) fascinating paper on the topic that follows up the earlier work from 2007. It is clearly presented and very well written, and I have little reservation in recommending its full publication in ACP. I suggest a few points below where the paper could give a few more details. If these are attended to in the revision then it should be a really excellent paper.

Specific comments

p33147 (Abstract) l16-18: Slight clarification needed for this sentence – the AOD value increases from 0.15 to 0.20 – rather than the increase in AOD being 0.15 to 0.20. (I think the increase in AOD is 0.05).

p33149 (Section 2) I am unclear exactly how the paintings are sampled to obtain a red-to-green ratio. I guess only parts of the paintings are sampled? (i.e. just the sky, or just parts of the sky?) Or have I got this wrong and the whole painting is sampled? Please could you elaborate on the exact process, perhaps keeping in mind the principle that based on your description of the technique, anyone should be able to repeat your measurements and (hopefully) obtain the same results? Assuming that just parts of the painting are sampled, presumably this corresponds to many (thousands of?) pixels over the whole digital image. Is the R/G value reported just the mean of all these values? I wonder if the full range, or PDF, of values may also be interesting, even if only to add an error estimate on the R/G value?

p33150 l13 What is C.L.?

p33151 l5 Digitization, rather than digitalization? (Maybe they are equivalent...)

p33151 (Section 3) What is the geographic spread of the painting locations, and is this important? I am guessing most if not all are from Europe. I appreciate that volcanic aerosol, at least from very large eruptions, is thought to spread globally or at least hemispherically, so maybe sampling only over Europe is not a significant bias. However you are also interpreting your results in terms of changes of tropospheric aerosol related to industrialisation. Are you only really surveying AOD changes over Europe (or particular parts of Europe) with the data from the paintings?

Related to this point, the origin of the DVI values should be briefly described. Are they based on ice core data, or by other methods? In other words, it should be clarified if the comparison presented in Figure 4 is really comparing similar quantities, or should we perhaps expect (potentially important) differences due to the different methods employed in calculating each proxy? Are the indices (etc.) presented in Figure 4 considered global, or relating to one or other hemisphere?

p33152 l4 at -> from

p33152 l17 'no major volcanic eruptions between 1900 and 1960' – What about Santa Maria (1903) and Katmai (1912) – both VEI 6 according to your Table A2?

p33152 l21 (and at least once elsewhere): IPCC recommends reference is made to individual chapters in its reports rather than the whole report, if possible.

p33154 l6 Suggest delete 'the needs of'.

p33155 (Section 5.2) Does dust explain all/most of the AOD? Presumably it is relatively straightforward to convert between dust column amount (in g/m²) and AOD. Couldn't you do this to confirm that dust is the aerosol?

Where was the instrument measuring AOD relative to the painter? (Presumably close by).

p33172 (Figure 6) I suggest zooming in a bit on the area of interest (i.e. the Eastern Mediterranean), and increasing the sensitivity of the colour scale for dust load (currently there is just a green blob over Greece at both times). Also indicate the location of Hydra?

Comment about Alan Robock's comment #5 ("Use a comma after every "e.g." and "i.e.>"). I think this is not always the case – but I suggest ask the journal typesetters.