

## ***Interactive comment on “Volcanic stratospheric sulphur injections and aerosol optical depth from 500 BCE to 1900 CE” by Matthew Toohey and Michael Sigl***

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This is an important paper that will be widely read and cited by the paleoclimate community. It provides the (current) definitive record of explosive volcanism and estimates of the resulting stratospheric aerosol optical depth for the last 2500 years, based on a large set of ice core records from both Poles. The paper is clearly written, well-organised and unambiguous. It requires no revision, though I would have liked to see a bit more discussion of the events around 536CE (since they have received a lot of attention in the literature), & how the missing record from GISP2 might have affected the estimate of volcanism at this time. Similarly, there was nothing explicitly said about

C1

the ~1808/1809 eruption that preceded Tambora; previous studies have often ascribed this to a tropical eruption that might have contributed to the overall climatic impact of the subsequent 1815 event. In Table 2, this appears to be linked to Laki (Grimsvotn), yet I had the impression that there was a pretty big signal at that time in Antarctic records. . . Finally, I wonder why 45N & S is chosen for unknown extra-tropical eruptions – I would have thought that in the NH, the mean latitude of historic known explosive events is closer to 60N. Perhaps that could be checked and commented on. . . though it might not make a lot of difference to overall SAOD estimates.

I did not check all the citations, but noticed that Adolphi and Muscheler, 2016 was missing in the reference list, so perhaps there are others too....

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C2