

Interactive comment on “Effects of climate-induced changes in isoprene emissions after the eruption of Mount Pinatubo” by P. J. Telford et al.

Anonymous Referee #1

Received and published: 19 March 2010

The authors investigate the effect that climate changes in the early 1990's (including the Mt Pinatubo eruption) may have had on atmospheric composition via changes in isoprene emissions. This work makes use of the UKCA model with the SDGVM vegetation model. The authors suggest that decreases in isoprene emissions following Pinatubo may have led to elevated OH and an increased sink of methane. The article is succinct and the topic quite interesting. I have only a few suggestions to improve clarity.

1. Page 6874, line 22: Specify the year for the SST and sea-ice cover from HadISST
2. Page 6876, lines 1-2: “UKCA integration” is a bit ambiguous – please specify if the

C732

nudged ERA-40 meteorology used to drive the isoprene emissions as well.

3. Page 6876: Has the dynamic vegetation simulation been evaluated? How realistic is the distribution compared to satellite-derived LAI over the early 1990's?
4. Section 2: The Pinatubo forcing should be clearly described in the text. My understanding is that the authors have included only the meteorological impacts included in the nudged meteorology, but have neglected the effect of changes in both stratospheric sulfate and ozone on radiation (which could also impact isoprene emissions). This should be clearly stated.
5. Page 6878, lines 17-24: Clarify if the calculated correlations are temporal, spatial or both.
6. Section 4.1: The authors might consider adding a definition sentence here – it can be confusing for the reader to separate “climate” and “emissions” when isoprene emissions are climate-dependent. One might assume that a fixed-climate run (Metfix) would imply that isoprene emissions would be constant, which is not the case here.
7. Page 6881, lines 6-7: typo? I believe the authors mean that Base-Metfix represents the effect of interannual variations in climate.
8. Page 6881, last paragraph: The issue of isoprene oxidation at low NO_x is a very important topic. I recommend that this be discussed very briefly in the introduction as well – the knowledgeable reader will look for the context of this study early on.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 6871, 2010.