Supplementary Information

Heterogeneous uptake of gaseous hydrogen peroxide by Gobi and Saharan dust aerosols: a potential missing sink for H_2O_2 in the troposphere

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1. XPS

XPS measurements were carried out on the SCIENTA ESCA 300 instrument at the NCESS laboratory Daresbury, UK using monochromatic Al Kα radiation and a pass energy of 150 eV. The Saharan and Gobi dusts were affixed to the sample holder by means of double-sided non-conducting adhesive tape. To eliminate sample charging due to emission of photoelectrons during spectral acquisition, the sample surface was irradiated with low energy electrons beam from a flood-gun located in the spectrometer chamber. Quoted electron binding energies are referenced to that of graphitic carbon at 284.6 eV.

2. Fe 2p and Ti 2p XP Spectra for Saharan and Gobi dusts.

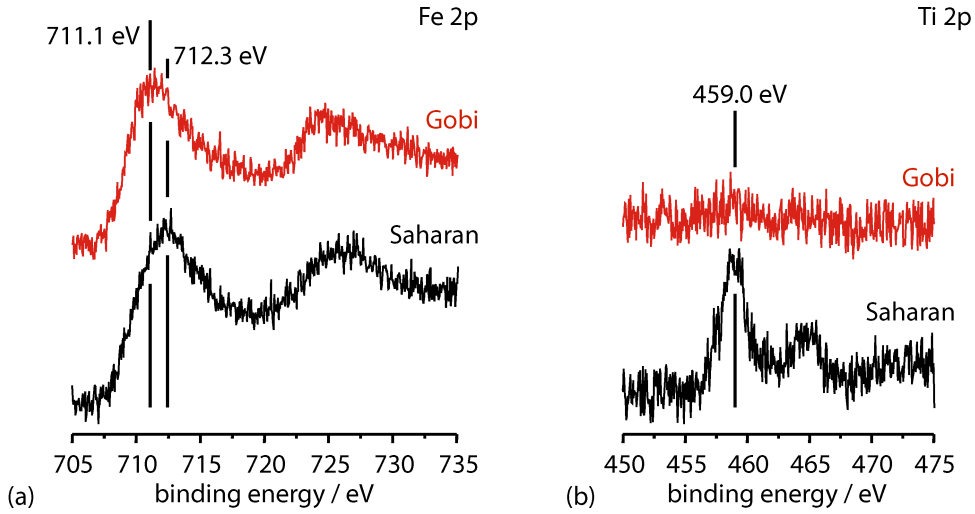

Figure S1. (a) Fe $2p_{3/2, 1/2}$ XP spectra of the Gobi and Saharan dusts. The Gobi sample contains only Fe_2O_3. The Saharan sample also contains Fe in another chemical state, possibly as a mixed oxide incorporating Na and/or K. (b) Ti $2p_{3/2, 1/2}$ XP spectra of the Gobi and Saharan dusts. Only the Saharan sample contains titanium. The Ti $2p_{3/2}$ appears at a binding energy of 459.0 eV characteristic of TiO_2.

3. Profiles of H_2O_2 and other trace gases as a function of time for the model runs.

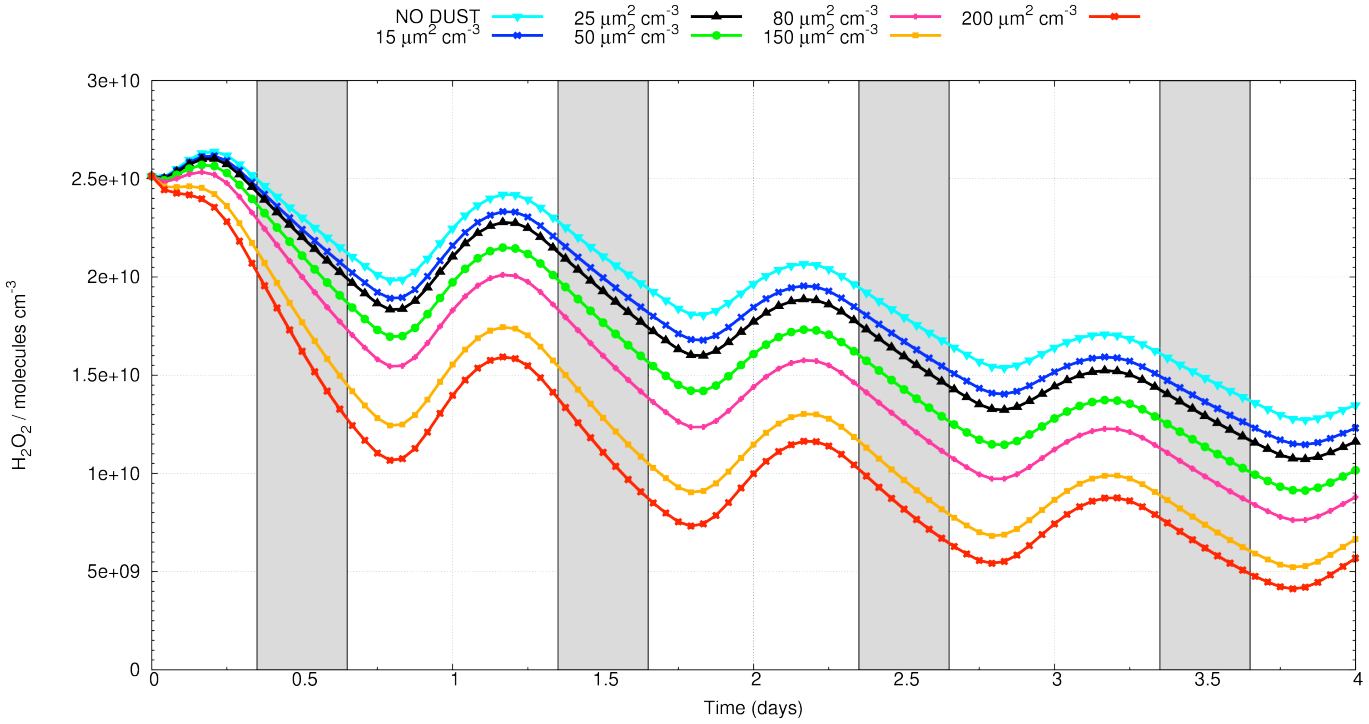

Figure S2. The box model calculated H_2O_2 mixing ratios are shown as a function of time and the dust S_a. The light grey areas refer to nighttime in the model.

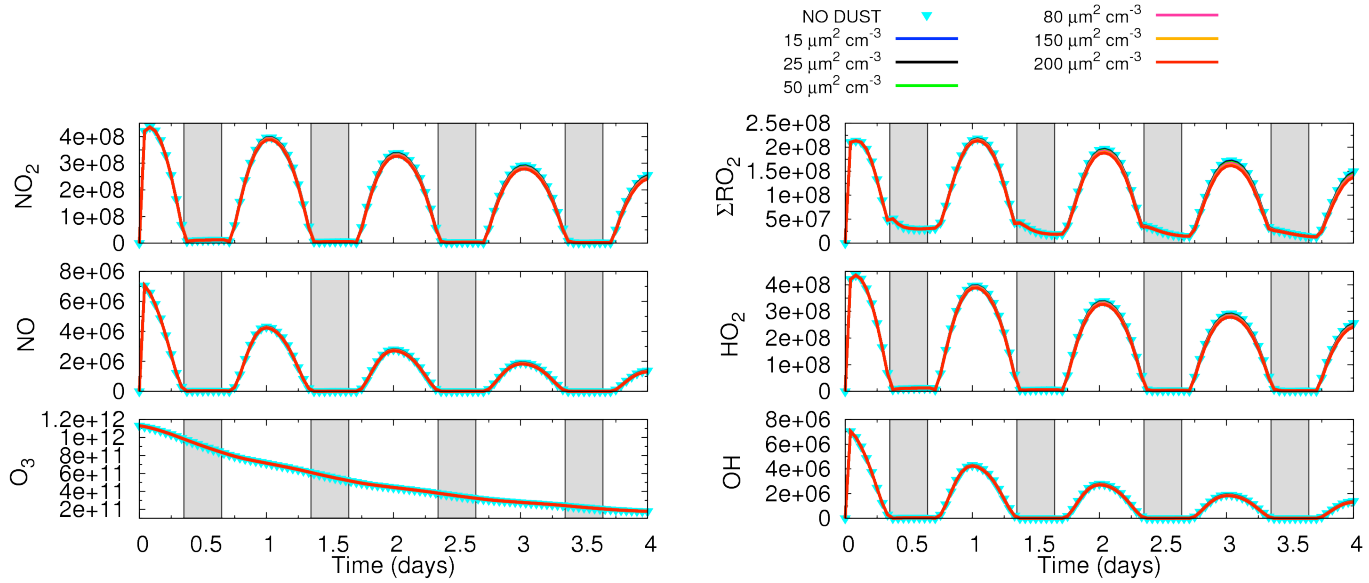

Figure S3. A comparison of model output for a selection of species in the different runs is shown. As in Figure S2 the grey areas refer to nighttime in the model.