

Interactive comment on “Systematic lumping of complex tropospheric chemical mechanisms using a time-scale based approach” by L. E. Whitehouse et al.

Anonymous Referee #2

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General Comments: This paper describes a reduction methodology for atmospheric chemistry models which leads to an impressive reduction in computational time whilst retaining good accuracy and importantly, retaining individual primary VOCs so that different emission scenarios may be tested. The novelty of this paper as compared to other reduction approaches is clearly set out in the introduction, the main points being the potential for automation and the more formal approach based on species lifetimes. The scientific methods are very clearly and completely explained. The presentation is very good and in general this is a well written paper, and certainly within the scope of ACP.

Specific Comments: I have one main query: on page 3795, it is stated that one of

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the criteria for lumping is that rate coefficients should be "within a certain percentage". Some guidance on how closely the rate coefficients should match and what errors are propagated should be given.

Technical corrections: Page 3790 Ln 18: explain PAR Page 3796 Ln 19: replace in time dependent with is time dependent Page 3797 Ln 1: replace define with defined Page 3801 Ln 26: $C_2H_5CO_3H$ (LHS of equation) should be $C_2H_5CO_3$ Page 3802 Ln 20: $[2-CH_3C_6H_4CO_3H]$ in equation for t_3 should be $[2-CH_3C_6H_4CO_3]$

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 3785, 2004.

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