

## ***Interactive comment on “A discussion on the determination of atmospheric OH and its trends” by P. Jöckel et al.***

### **Anonymous Referee #2**

Received and published: 14 November 2002

The paper provides an excellent platform for the discussion of the use of tracers to measure global and even regional OH levels. Issues that arise from the range of referees comments are:

1. That a more extensive exploration of possible tracers would be useful. It is noted that MCF may not be sensitive to OH levels in the 8-12 km region and that other tracers with near zero activation energy may be more sensitive. I believe that further model investigations of a range of hypothetical tracers ranging in lifetime from a few months to years would be extremely useful. However, the paper is excellent as it stands and to this end I would encourage the authors to carry out these additional studies and to submit a supplementary paper to ACP.
2. That meteorological noise is an important consideration when determining [OH] and

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it is suggested that observed meteorology should be used in any modelling exercise rather than climatological data.

3. An important comment is how to optimise the location of the observing stations and a range of model optimisation strategies can be adopted. It would indeed, as one referee noted, be useful to carry out an inversion of the model derived tracer field and compare retrieved OH with 'actual' model OH. It would then be possible to use this inversion process as a tool for optimising the location of the stations.

In conclusion I recommend publication of this paper without further modifications. It is an excellent platform for a debate on the use of chemical tracers to derive global OH. There are myriad modelling studies that can be performed and I would encourage the authors to investigate the usefulness of releasing a range of tracers with very differing lifetimes and with additional removal pathways. I look forward to seeing these future studies.

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Interactive comment on Atmos. Chem. Phys. Discuss., 2, 1261, 2002.

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