

Interactive comment on “Severe ozone air pollution in the Persian Gulf region” by J. Lelieveld et al.

Anonymous Referee #1

Received and published: 24 November 2008

This is a scientifically very interesting and sound paper that investigates the high ozone levels observed from space in the Persian Gulf region by applying the general circulation global model ECHAM5 coupled to appropriate sub-model for Atmospheric Chemistry studies. Their model simulations indicate the persistence of maxima values of ozone between the surface and about 750 hPa that contribute to severe air pollution problems in the area. This study is well in the scope of ACP and is worth publication after some corrections that will improve the manuscript.

In addition to the ref#2 comments, I would suggest that the authors provide a careful quantitative analysis of ozone budget over the area per season: i.e. contribution (to the background and to the episodic levels of ozone as appropriate) of STE, long range transport and local sources (if possible per major source category) as well as deposi-

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tion fluxes, outflux from the area. The authors have the tools to do such analysis and will provide added value to the results shown here.

Furthermore source apportionment information for local source but also for the long range transport would be very useful. In addition information on the major pathways for LRT from the various source areas (e.g. boundary layer, middle or high troposphere) would be beneficial.

It is also not clear to me whether the stratospheric influence to ozone levels that reaches almost the ground level, shown in Figure 9, is a typical feature or only relevant for the year 2006 that is shown in this study.

Does Figure 4 refer to surface levels? Could you also provide NO_x and HNO₃ levels in the area? Could the authors add the background ozone in Figure 4?

In addition, I would like to stress the need of use of coherent averaging kernels when comparing satellite data with model results as pointed out also by the other referee. This comparison has to be appropriately performed.

Finally the revised version of the manuscript has to be checked out for a small number of typographic and reference errors that exist in the ACPD manuscript.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 17739, 2008.

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