

## ***Interactive comment on “Reconciliation of essential process parameters for an enhanced predictability of Arctic stratospheric ozone loss and its climate interactions” by M. von Hobe et al.***

**J.-P. Pommereau (Referee)**

pommereau@aerov.jussieu.fr

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The paper is to provide an overview of the Reconcile project aiming at investigating several still unclear aspects of polar stratospheric ozone depletion processes (kinetics, PSC nucleation, exchange between inner vortex and the outside...) and improving the representation of ozone loss in global climatic models for better predicting the possible influence of climate change on ozone.

General comments An overview paper summarizing the objectives, the realisation (laboratory investigations, field deployments, modelling activities, etc) and, most importantly, the results of such large project, is by no doubt useful as a reference for the

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other papers published in the special issue or elsewhere. In that sense such overview deserves publication. However, as already noted by S. Solomon, the way it's written, mixing scientific reviews, project report, results more or less proven, including from other projects, is inadequate. The paper should be more Reconcile results oriented. Even if the details are available in co-authors papers, it is not enough to just quote them. Each section should include a short demonstration by using for example one of the most informative figure extracted from the co-author paper, a short discussion and conclusions (missing in several sections). I fully understand the difficulty of writing a project overview paper but as it stands today, it cannot be accepted and requires at least very deep revision.

Specific comments

I will no repeat here all S Solomon's remarks, which I share, but instead I will make some suggestions for reorganising the paper in the shape of an overview paper.

My first concern is the exact content of Reconcile. If other activities than the 2010 Arctic campaign, such as the Match sondes of 2011, Arctic ozone loss 2011, Antarctic ozone hole modelling, Antarctic trends studies, balloon flight in Kiruna for bromine studies in September 2009, CCM models evaluations, etc, are part of the project, this must be explained at the beginning, in the description of the project.

The use of the term Reconciliation in the title is inappropriate since it applies only to the debate on JCIOOCI ,which was already solved at the beginning of the project.

Abstract. A few lines to explain what Reconcile is and then concentrate on newest and most important results only (e.g. impact of mixing across the vortex edge on chlorine deactivation, consequence of revision of bromine photochemistry on total Bry estimate, nature of background aerosol, reconciliation of ClOx kinetic parameter, NAT nucleation, others..)

1. Introduction: There is no reason to repeat here the ozone hole history, far incom-

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plete and already available elsewhere. The introduction should mainly put Reconcile objectives into context: what was needed to be reconciled? Which chemical, micro-physical and transport processes were still little known or debated before the project? What was the current understanding of the relation between ozone depletion and climate change? What was missing for better predictions? Then, list Reconcile objectives and project strategy: lab, field campaigns, satellites and various modelling. (Figs 1, 2, little informative, could be removed), including other activities, e.g. 2011 Arctic loss, Antarctic etc..

2. Reconcile strategy and activities Certainly needed. Field observations: 1. Geophysica aircraft campaign (details on operations, trajectories etc if necessary in appendix or supplemental material. Same for details of sondes and balloon instruments). 2. Match sondes and balloon activities, better in 3 sub sections: i) Match sonde, ii) Ny Alesund PSC sondes and Lapbiat-II PSC/water vapor sondes in Sodankyla. Both within or coordinated with Reconcile? iii) MIPAS/TELIS balloon flight in Kiruna. . . . .

But what about other activities than those directly linked to the 2010 winter Arctic campaign?

3. Results The current section "Processes in the Arctic vortex" is very difficult to follow since it's mixing items relevant to the Arctic vortex and many others (bromine in the summer, Antarctic, ozone trends, halogen source gases). . . This section needs to be reorganised by separating the various issues. Missing is a conclusion summarizing which new information on ozone destruction has been gained from Reconcile

4. Progress in global chemistry climate modelling The first sentences refer to the use of the PSC scheme developed during Reconcile in a CTM model showing improved representation of MLS HNO<sub>3</sub> measurements, with no more details. It would be better located in the previous section. The following refers to a study of the influence of half-year, annual and quasi-biennial oscillations in a CCM, and the last paragraph to unpublished studies of surface UV trends from satellite measurements. I can't find

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how the representation of polar ozone depletion by global models has been improved. If there is no more information on the subject, I don't see the need for keeping this section.

5. Conclusions This is not the place for a further discussion on the "gate to the stratosphere". What is expected here is a summary of the newest and most important results of Reconcile (and how they could help improving the and predictions of ozone destruction, if it is the case).

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 30661, 2012.

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