

***Interactive comment on “Diurnal variation of stratospheric HOCl, ClO and HO<sub>2</sub> at the equator: comparison of 1-D model calculations with measurements of satellite instruments” by M. Khosravi et al.***

**Anonymous Referee #2**

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Review of the paper “Diurnal variation of stratospheric HOCl, ClO and HO<sub>2</sub> at the equator: comparison of 1-D model calculations with measurements of satellite instruments” by M. Khosravi et al.

In this paper, the authors report on a detailed study of stratospheric HOCl, ClO, HO<sub>2</sub>, and HCl around the equator. To this end, they compare measurements from various satellite instruments among each other and with the results from a 1d model. In addition, they use the model to investigate the impact of variations in the reaction rate coefficients between ClO and HO<sub>2</sub> on the HOCl diurnal variation in an attempt to iden-

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tify, which of the values published in the literature gives the most realistic results.

**Major Comments**

The paper is clearly structured and overall well written. It presents a large data set and a detailed comparison between different observations and model results. The SMILES diurnal variations are used as a transfer standard for comparisons between instruments with different observation times and for offset correction which is a sound approach. To my knowledge, there has never before been such comprehensive comparison. In addition, the kinetic study also gives clear indication for preferences on which value to use for the reaction rate coefficients of HOCl formation.

However, the problem with this paper is, that there is only very little new which the reader can learn from it:

- Most of the satellite data used have already been presented before
- The model used is pretty standard
- The main part of the paper consists of a lengthy description of the similarities and differences between individual results which a reader could also deduce just from looking at the figures
- The comparison between model and measurements is again very descriptive and does not provide any new insights on atmospheric processes or their description
- The kinetic study is nice but only confirms a similar result from an earlier study for another altitude

In summary, in my opinion the main value of the paper lies in the compilation of the large number of observations and their thorough processing and comparison. I think that a good job was done on this aspect of the study and I'm sure that the figures

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presented will be of interest for people working on stratospheric chlorine and hydrogen chemistry. However, due to the descriptive nature of the paper and the lack of really new results, I'm reluctant to recommend it for publication in ACP and would rather suggest to re-submit to another journal which is more oriented towards presentation of data.

Should the authors decide to submit a revised version of the manuscript, they will have to remove much of the text just describing what is in the plots. Instead, they will have to make a convincing point of what one can learn from the data and the comparisons performed in this study.

#### **Minor Comments**

P 21068, l5: at the wavelengths => at wavelengths

P 21068, l12: the polar ozone loss => polar ozone loss

P 21068, l15: there have been number => there have been a number

P 21069, l25: otherwise noted => unless otherwise noted

P 21075, l10: to hydrogen => to the hydrogen

P 21079, l8: which the mean => where the mean

P 21079, l22: is the => are the

P 21080, l28: of the model => of model

P 21082, l21, smaller then => smaller than

P 21082, l25, consistently => consistent

P 21083, l7: of the model => as the model

P 21083, l29: in a much lower => at a much lower

P 21084, l27: get a correct => get the correct

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P 21085, l11: the model reproduces very close HCl volume mixing ratio to all observations => the model reproduces very closely the HCl volume mixing ratio of all observations

P 21089, l19 the night-day => the model night-day

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 21065, 2012.