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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Simultaneous satellite observations of IO and BrO over Antarctica" *by* A. Schönhardt et al.

Anonymous Referee #3

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The discussion by Schoenhardt et al. presents simultaneous measurements of IO and BrO retrieved with the SCIAMACHY satellite instrument. Its strength is based on a consistent analysis and data averaging over a period of six years, which enables to locate differences and similarities in the spatial and temporal distribution of both trace gases. The authors include discussion on possible source and transport mechanisms with a particular focus on IO occurrences in relation to sea ice concentration. They also point out needs for further studies on this topic to be carried out by other measurement techniques to complement the information retrieved by satellite.

The paper is well written, provides an equally interesting as valuable data set and its content is perfectly suited for a publication in ACP.

General comments:

As mentioned above, the strength of the paper is based on the six year data set where particular distributions become visible "after suitable averaging steps" as the authors point out. It would be helpful if some more explanation on the choice of the averaging method could be included so that readers who are less familiar with statistical methods can better follow the benefits or possible disadvantages (?) of the chosen method versus other averaging methods.

Section 6 would benefit greatly from a Figure that visualizes the IO-BrO differences.

The temperature dependence of the IO cross section is a very interesting and important study by itself, which might be worth a separate publication.

Specific comments:

p.33658, ln.12: What is the detection limit based on?

p.33658, third paragraph: Is it possible to give some kind of AMF error estimate based on some typical Antarctic aerosol profiles? Or at least put a number range on the "small" AMF error?

p.33660, ln.2: Should it be "small amounts of IO above the detection limit" or "too much IO close to the detection limit? Perhaps replace "amounts" with "number of spectra" or "SCD measurements"

p.33660, ln.19: Perhaps change "is more meaningful than" to "is more meaningful for this study than"

Figs. 1,3,4, perhaps also 6: Should have an identical color scale/legend

Figs.4 and 6: Where do the negative VCDs come from? Could they be significant and if no, why are they not filtered out? Fig.8: It would help to be able to (better) identify latitude. Also, it would help to either have the same red box in Fig. 4 or have the respective months included in Fig.8 with the same box.

Technical corrections:

p.33662, ln.12 “in dependence of longitude” instead of “the longitude”

p.33667, ln.27: already been reduced

Fig. 6: change y-axis label to Month/Year

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 33651, 2011.