Atmos. Meas. Tech. Discuss., 6, C961–C964, 2013
www.atmos-meas-tech-discuss.net/6/C961/2013/

Atmospheric Measurement Techniques Discussions

Interactive comment on "Arctic ozone loss in Siberia in 2011 and 2012" *by* V. Dorokhov et al.

Anonymous Referee #1

Received and published: 17 May 2013

General comments:

This paper investigates the Arctic ozone loss in spring 2011 above Siberia using data from Brewer spectrophotometers, SAOZ instruments, and ozonesondes. These datasets are described in detail and the timeseries for 2011 and other years are presented. The goals described in the abstract and discussed in the paper could be improved. What makes this paper interesting? Are you presenting any new datasets? Is this the first use of any of these datasets to study this event? What does this contribute to previous studies of the 2011 ozone loss? I think that the paper would require a large reorganization in order to rework these goals and to clarify the results. Therefore, I would recommend that this paper be re-submitted after major revisions. Some suggestions on how to improve the quality and structure of the paper are given below.

Suggestions for organization:

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

Title: Only the ozonesonde section focuses on 2011 and 2012. The other sections include data from other years. Please rename to encompass all results.

Section 1: This introduction is very brief and doesn't do much to frame the goals of your paper. Perhaps you could include a literature review of the 2011 Arctic ozone loss and identify gaps in the studies that your work fills (e.g., certain types of measurements, the Siberian measurement locations, ...?). You could also add a few sentences about what type of information ground-based measurements and ozonesondes over specific sites can add to previous satellite and modeling studies.

Section 2: I like the individual descriptions of the datasets. At the top of the section you could discuss why you chose to use these datasets together. Is it because they cover different geographical regions or different time-periods, or have different advantages/disadvantages under certain conditions?

Section 3: These sub-sections should be reorganized for clear presentation of results.

- Move/combine all descriptions of the measurement sites, instruments, and measurement practices to Sect. 2 (for example, p2962, lines 3-8 and p 2966, lines 3-19). Instead, focus only on your results (e.g., the amounts of ozone measured by these instruments in different years).

- Combine and move all paragraphs/sentences with literature review of the ozone loss to the introduction (for example, p2964, lines 21 to p2965, line 5; p2066 lines 1-4).

- Refer to all figures before presenting results from the figures. Make sure that it is clear where the data you are describing from (e.g., from the figure, from a previous study).

- Discuss how your results compare with previous studies of the 2011 ozone loss and how your results contribute to the study of this event. E.g., are the ozone minima that you measure consistent with other studies?

Section 4: Summarize with a concrete set of results. This could, for example, include a table covering various stations of, e.g., minimum ozone measurements in 2011, percent

AMTD
6, C961–C964, 2013

difference between 2011 ozone and previous years, etc.

Specific comments:

Page 2959, Line 18: What version of the SAOZ data are you using? Are you using the updated SAOZ ozone data? If so, it may be worth mentioning the good agreement with Brewer instruments (see, e.g., Hendrick et al, ACP, 2011).

Page 2961, lines 8-14: What do you mean by "level of total ozone over the territory of the Russian Federation"? Is this the average column ozone over all regions in Russia? Or is this over a specific location? Where does this information about the historical records come from? Cite source or describe data and analyses used.

P2963, lines 15-17: Is this for a single SAOZ station or all stations? How are the ozone loss rates calculated? Was this done for this paper? Or are you referring to a different study (if so cite references).

P2963, lines 26: Discuss your reasons for showing the SAOZ NO2 measurements. What do they contribute to your study?

Page 2964, lines 8-20: Are you using this trajectory information in your work? If so, describe how. If not, compress this into a couple sentences and add to Sect. 2.

Page 2965, lines 6-24: Are you describing previous studies here? If so, cite the work and explain how these studies are relevant to your results.

Page 2965, lines 25-26: Is this from your ozonesonde measurements? Describe what the "observed ozone decrease" is relative to (previous years?).

Figs 4 and 5: Present in the same way as Figs 2 and 3, so that the reader can easily compare results from different stations.

Fig. 6: Add markers for the other stations in your study and discuss what other stations measure on these dates. Are they all within the region of ozone loss? Are some measuring outside the vortex?

AMTD

6, C961–C964, 2013

Fig.7: You could also show some seasonal averages of ozonesondes from 2011 and other years to demonstrate how 2011 is unusual.

Technical corrections:

There are many grammatical and spelling errors throughout the paper. I would recommend using a spell-checker and getting someone to help proof-read.

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 2955, 2013.