Atmos. Chem. Phys. Discuss., 13, C3550–C3551, 2013
www.atmos-chem-phys-discuss.net/13/C3550/2013/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "A global historical ozone data set and signatures of El Niño and the 11-yr solar cycle" *by* S. Brönnimann et al.

Anonymous Referee #2

Received and published: 12 June 2013

Review of 'A global historical ozone data set and signatures of El Nino and the 11-yr solar cycle by Bronnimann et al.

This paper introduces a new approach for setting up a long-term ozone data set via assimilating various available ozone observations. The paper also presents some preliminary analysis on ENSO and 11yr solar cycle signals in this ozone data set. Overall, the efforts of this work are worthwhile and the new long-term ozone data is somewhat useful for scientific community. The main merit of this data set is extending the ozone time series backward to 1900. However, the robustness of the assimilated ozone time series from 1900-1970 is lack of verification. Ozone observations in the time period 1900-1970 are very rare and the ozone time series for this period is set up mainly via regression method based on meteorological fields which are also not reliable. For the

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

assimilation approach, the results show that the approach can not significantly improve the data quality relative to the model background at the full temporal and spatial resolution. A question arise here as what is the advancement of this data relative to previous longer-term ozone time series. The following are some specific comments:

1. Figure 4 indicates that the original SOCOL ozone time series at the latitude band 30oN-90oN is out of phase with the debiased SOCOL time series and BDBP. Does this imply SOCOL simulations have serious problems?

2. Figure 5 indicates that the raw and zonally adjusted TOMS total column ozone data have large differences and some small scale details disappear in the spatial distributions of the adjusted TOMS ozone compared with the raw data. One may wonder whether those fine details in the raw data are true signals or are smoothed out after the adjustment.

3. It is concluded in the paper that there is a more pronounced effect of ENSO and slightly weaker effect of the 11 yr solar cycle in the earlier period. It is interesting to discuss whether the weaker effect of the11 yr solar cycle in the earlier period is caused by the stronger ENSO effect or by the solar activity changes.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 7767, 2013.