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Interactive comment on "Accuracy, precision, and temperature dependence of Pandora total ozone measurements estimated from a comparison with the Brewer triad in Toronto" *by* Xiaoyi Zhao et al.

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We appreciate the helpful comments from referee #3. We have revised the manuscript based on your suggestions. Please note the page and line numbers in our response are referring to the numbers in the revised manuscript (but the referee's comments refer to numbers in the AMTD version).

The paper in some sections follows a report-like approach by providing too many details rather than trying to summarize the results. For instance the authors tried type I and type II residuals but mostly base their conclusions on type II. They should consider showing only type II, which will make the discussion and plots clearer.

The motivation for using two different types of residual ozone is to validate and illustrate the different choices that can be made in the variable estimation method. Although using the daily mean value as a low frequency signal (as in residual type 1 calculation) has some shortcomings, it is more straightforward than using the complex 2nd order function for residual type 2 (Eq. 8). By showing the consistent results from both type 1 and 2 on Fig. 2, we validated the use of the 2nd order polynomial function (Eq. 8).

As suggested by referee #2, we included some further discussion and summary about the type 1 and 2 results in the relevant section (see the revised manuscript, page 9 lines 10-15). The comparison of two residuals helps us to understand more details about the variable estimation method. For example, the type 1 residual data is more sensitive to the days that have large daily ozone variation. Because of this, type 1 residual needs a larger data size than residual type 2 to avoid unrealistic estimated variance (too low or even negative). In addition, some improvement can be found in Fig. 2 when using residual type 2, as discussed in section 3.2. So we prefer not to remove the type 1 residual from the manuscript.

Page 14 line 13: Was the double Brewer introduced earlier than 1996? Please check.

Revised, see page 14 line 28. Thank you for catching the typo. The double Brewer MKIII was introduced in 1992, as presented in the introduction section.

How do the OMI comparisons fit to the concept of the paper? Is it to demonstrate the use of Pandora as reference for the validation of satellite data?

The use of OMI data in the present work was to validate the proposed temperature

dependence correction functions for Pandoras (Eq. 11 and 12). The satellite validation is beyond the scope of our current work. In fact, the Pandora vs. OMI ozone measurement validation work has been done by Tzortziou et al. (2012). The relevant results from the present work are consistent with Tzortziou et al. (2012).

In the conclusions eventually the authors should recommend some improvement to the operational Pandora algorithm (e.g. to minimize the temperature dependence).

The Pandora research group is working on developing an algorithm to derive the effective ozone temperature directly from Pandora measurements. The derived ozone temperature will be used to minimize the temperature dependence. We have included this information on Page 16 lines 16-18.

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Discussion paper