

Response to Anonymous Referee #4

Specific Points

#1. Several issues are combined here.

- The uncertainty in the trend derived from the two analysis methods is fully addressed in the Supplement, which will supersede Table 1 from the discussion paper in a revised manuscript.
- Mesospheric CIO: addressed in the Supplement
- Variation of CIO with SZA: the measurement and retrieval procedure is described in detail in Solomon et al, 2006. That will be made more explicit in a revised manuscript. Our 'daytime' observations are averages from 0900-1700 Hawaiian Standard Time, during which CIO has been observed to be relative little changed. The diurnal variation of CIO with SZA in the stratosphere was first observed in detail by Solomon et al, 1984.

#2. Several issues are combined:

- As stated above, Solomon et al, 2006 is the best reference for the retrieval method. The same a priori profile is used for the entire data set.
- Averaging kernels: addressed in the Supplement
- Mesospheric CIO (raised twice in #2): addressed in the Supplement
- Baseline and interfering ozone spectrum: These questions have been addressed in previous publications, such as Nedoluha et al, 2011, Solomon et al, 2006, and Solomon et al, 2000, and answering them fully would require extended repetition of that material. In brief, the system baseline is not retrieved simultaneously with the CIO profile; it is removed and the uncertainty in its removal included in estimating the error in the result. Ozone diurnal variation affects a very narrow region, less than 10 MHz wide, near the ozone line center, which is approximately 130 MHz from the CIO line center. That region around the ozone line is excluded from the analysis.

#3.

- '5 km wide': addressed in the Supplement
- SZA criteria: see #1 above
- Table 1: already included the value from Solomon et al, 2006; the table will be superseded by the expanded version in the Supplement.
- 2008-2009: these values, in both time series, are neither better nor worse than the rest of the time series, and are unrelated to the subsequent instrument failure

#4.

- As described in the Supplement, Aura profiles occur at approximately 1330 and 0155 local time. The use of these profiles for comparison to Mauna Kea was discussed in Nedoluha et al, 2011.

#5

- The subject of variations in the CIO trend is the subject of our last remark in the Supplement. It is a prime candidate for a future study, made more feasible by the analysis change reported here.