

1 **Comparison of profile total ozone from SBUV(v8.6) with**
2 **GOME-type and ground-based total ozone for 16-year**
3 **period (1996 to 2011)**

4 **Changes made in the Revised manuscript:**

5 (1) Response to comment #1:

6 * The following has been added to section 2.1 (Line 16-24, page 4) for additional
7 information regarding previous SBUV-MOD (i.e. v8.0):

8 The previous v8.0 MOD(Merged Ozone Data Set) used measurements from TOMS
9 instruments on the Nimbus-7 and Earth Probe satellites, the Ozone
10 Monitoring Instrument(OMI) on the AURA satellite and SBUV integrated column
11 ozone. The newly released SBUV v8.6 MOD used profile total ozone
12 measurements from SBUV-type instruments.

13 Although modifications in instrument design were made in the evolution from SBUV
14 instrument to the modern SBUV(2) model, the basic principles of the measurements
15 technique and retrieval algorithm remain the same, lending consistency to this
16 record compared to those based on measurements using different
17 instruments.

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19 (2) Response to comment #5

20 * The following paragraph has been added to section 2.1 (Line 5-8, page 5),
21 discussing the effect of changes in cross sections:

22 Results of the study for the effect of applying the new cross sections to SBUV
23 retrievals indicate that the ozone profiles are lower in the upper stratosphere and
24 higher in the lower stratosphere and troposphere. As a result, the average differences
25 in total ozone are small, and close to zero in the tropics.

1 (3) Response to comment #2:

2 * The following paragraph has been added to section 2.1 (Line 9-13, page 5) for
3 differences between v8.0 and v8.6:

4 Recent studies of the differences in total ozone between v8.6 and v8.0 MODs indicate
5 that v8.6 is 0.5 to 1% lower than v8.0 at all times except in the mid-1990s, when v8.6
6 is 1% higher. The difference in mid-1990 is related to the use of NOAA-14 in the new
7 version rather than the NOAA-9 used in the v8.0 MOD product. The deviation in mid-
8 1982 results from different treatment of the data after the eruption of El Chichon in
9 late March, 1982.

10 (4) Response to comment #6

11 In Section 3.2, the following paragraph has been added (Line 25-29, page 8) (Line 1-
12 2, page 9):

13 In the (50-30°S) region, the differences GTO minus SBUV in Fig.6 show slight
14 increase in the second half of the period. This increase is probably related to the usage
15 of SCIAMACHY with a restricted sampling due to alternating nadir/limb modes. For
16 the Ground-based minus SBUV differences, there are two periods, namely, beginning
17 of 2007 and end of 2009 where the differences show larger deviations in (0-30°N).
18 The explanation is not readily apparent and further investigation in this regard is
19 worthwhile once revised data records become available in the near future.

20 (5) Response to comment #7

21 (Line 15-16,page 9)

22 “For the purpose of our current study” has been changed to “For each of the three data
23 records”.

24 (6) Response to comment #8

25 * In section 3.4 (line 3-4, page 10), the following has been added:

26 For each of the three data records, (61) seasonal zonal means were computed for March
27 1996 through May 2011.

28 (7) In Table(5), the typo in the last column has been corrected from “7.74” to “5.74”.

1 (8) Response to comment #9

2 The estimated uncertainties for the Trends of the Differences were added to the entries
3 of Table 8a-b.

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