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Atmos. Chem. Phys., 3, 1409-1419, 2003

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## Comparison of total ozone from the satellite instruments GOME and TOMS with measurements from the Dobson network 1996–2000

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**Abstract.** Over the last 3 decades, satellite data have been used to monitor long-term global changes in stratospheric ozone. The TOMS series (1978-present) and GOME (1995-present) are two very important instruments in this context. In this paper, TOMS total ozone and three approaches to derive total ozone from GOME measurements are validated with ground-based Dobson network data. Beyond the operational products of both instruments, e.g. TOMS version 7 and GOME Data Processor version 2.7, total ozone is calculated by integrating FURM ozone profiles and by applying the TOMS algorithm to the GOME spectra. All algorithms show in general good agreement with ground-based measurements. The operational GOME total ozone shows seasonal variations, most likely introduced by difficulties in the derivation of air mass factors, which convert measured slant columns into vertical columns. The TOMS algorithm estimates on average 2% higher total ozone in the southern hemisphere than in the northern for both instruments as compared to the ground-based data, indicating that the source of the observed hemispheric differences is in the TOMS algorithm. Both instruments show aging effects in 2000, leading to enhanced variability in the ozone column differences with respect to Dobson data. In addition, the integrated GOME ozone profiles and the TOMS algorithm applied to GOME data show larger mean deviations in 2000.

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Citation: Bramstedt, K., Gleason, J., Loyola, D., Thomas, W., Bracher, A., Weber, M., and Burrows, J. P.: Comparison of total ozone from the satellite instruments GOME and TOMS with measurements from the Dobson network 1996–2000, Atmos. Chem. Phys., 3, 1409-1419, 2003. ▣ [Bibtex](#) ▣ [EndNote](#) ▣ [Reference Manager](#)

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