

HEIGHT RESOLVED OZONE HOLE STRUCTURE AS OBSERVED BY GOME-2

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Abstract

We present GOME-2 ozone profiles that were operationally retrieved with the KNMI OPERA algorithm for the period September-December 2008. It is shown that for the first time it is possible to accurately measure the vertical distribution of stratospheric ozone for Antarctic ozone hole conditions from spectra measured at ultraviolet and visible wavelengths. Comparisons with ozone sonde observations from the Neumayer station at the Antarctic coast show an excellent agreement for various ozone profile shapes representing different phases of the annual ozone hole cycle. A time series analysis shows the development and recovery of the ozone hole in great detail. Around the time of maximum ozone depletion in the middle of October we created latitudinal and longitudinal cross sections of the atmosphere centered on the Neumayer station. These cross sections give a clear view of the extent of the ozone hole in both North-South and East-West direction and its dynamics. A preliminary analysis of the three-dimensional structure of the ozone hole shows for example that at the vortex edges ozone rich mid-latitude middle and upper stratospheric layers are superimposed over ozone depleted lower stratospheric 'ozone hole' layers. These Antarctic ozone profile observations combined with the daily global coverage of GOME-2 enables the monitoring of the three-dimensional structure of the ozone hole on a daily basis.

REFERENCES

van Peet, J. C. A., R. J. van der A, A. T. J. de Laat, O. N. E. Tuinder, G. König-Langlo, and J. Wittig (2009), Height resolved ozone hole structure as observed by the Global Ozone Monitoring Experiment-2, *Geophys. Res. Lett.*, **36**, L11816, doi:10.1029/2009GL038603.