Geophysical Research Abstracts
Vol. 19, EGU2017-3242, 2017
EGU General Assembly 2017


# Preliminary results of the Umkehr and ozonosonde ozone profile intercomparison at Marambio Base, Antarctica

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Retrieved ozone profiles can be a useful tool to monitor the current state of the stratospheric ozone layer and the recovery of the Antarctic ozone hole. At the Marambio Base (64° S, 56° W), located in the Antarctic Peninsula Region, the ozone profiles are obtained by the ozonesonde observations or the Umkehr method from the Brewer spectrophotometer B199. The instrument is operated by the Czech Hydrometeorological Institute and was installed in February 2010. The ozonesonde observations have been carried out by the Finnish Meteorological Institute since late 1980s, with the highest frequency during austral spring months. In this study, the vertical ozone profiles during spring and summer 2015 were compared. The year 2015 was selected because of the late onset of the ozone hole, which offered the possibility to start the intercomparison from the beginning of the ozone hole formation. We have selected 20 days in August–December 2015, when both Umkehr and ozonesonde measurements were available. Because the ozonesonde balloon can only ascend to altitudes of about 30 km, only Umkehr layers 0–5 were taken into account. The largest mean differences between the ozonesonde and Umkehr measurements were observed in the Umkehr layer 4 with the approximate layer base height at 19.0 km. In this level, the ozonesonde observations exceeded the Umkehr retrievals in average by 10.6 %. On the other hand, in the Umkehr layer 3 with the approximate layer base height at 14.6 km, the Umkehr ozone retrievals were in average by 10.2 % higher than the ozonesonde measurements. The Umkehr and ozonesonde profiles differed largely during the ozone hole period or when the solar zenith angle for Umkehr retrievals was low. However, the ozone profile differences in the selected days varied greatly and were further analyzed and presented in the form of case studies.