Geophysical Research Abstracts, Vol. 8, 09861, 2006
SRef-ID: 1607-7962/gra/EGU06-A-09861

An overview of the 2005 Antarctic ozone hole

G. Braathen (1) and/for the 2005 ozone hole team
(1) WMO

The 2005 south polar vortex was close to the average of the last decade in terms of vortex area and temperature conditions. However, minimum temperatures inside the vortex were in early September near the coldest recorded since 1979. The area where total ozone was less than 220DU (also called "ozone hole area") was larger than ever before during the first two weeks of August. During the last two weeks of August and the first three weeks of September the ozone hole area continued to increase at a pace close to the average of the last 10 years. The ozone hole reached a maximum area of about 27Mkm2 on 19 September. Comparing with total ozone data of the last decade from GOME and SCIAMACHY, the 2005 ozone hole ranks as the third largest on record. During the last week of September and through October the ozone hole area declined at the about the same rate as most of the previous ten years, but in mid-November it dropped from 14 to 3Mkm2 in a matter of one week. The development of the ozone hole size in comparison to earlier years will be discussed in more detail. The 2005 ozone hole thus strengthens the tendency towards the ozone hole reaching its peak earlier in the season and also breaking down earlier than during the 1990s. All the ozone holes from year 2000 until now, with the exception of 2001, have declined more rapidly in the mid-October to mid-November period than during the years from 1996 to 1999. This change in the temporal evolution of the ozone hole over the course of the winter/spring season points to changes in the meteorological conditions. In particular, the large decrease in the ozone hole area from 2003 to 2004 and the large increase again from 2004 to 2005 cannot be explained by changes in the stratospheric halogen loading, but are due to interannual dynamical variability. This variability will make it difficult to detect the onset of ozone recovery in Antarctica, and in particular it will be difficult to attribute any positive change in ozone to declining amounts of ozone depleting substances. Some stations have observed total ozone columns that are close to the all-time low for those stations. There have also been episodes of unusually large total ozone columns at some stations. This variability in ozone observations

demonstrates the importance of dynamical processes, in particular the position of the polar vortex relative to the measurement site, in addition to the chemical destruction caused by ozone depleting substances. Some examples from individual stations will be discussed. The chemical evolution of the 2005 south polar vortex will be discussed with the help of data from the MLS/AURA satellite instrument and compared to the 2004 south polar vortex.