Geophysical Research Abstracts,
Vol. 10, EGU2008-A-02267, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-02267
EGU General Assembly 2008

The 2007 ozone hole as measured at South Pole Station: any sign of the beginning of recovery?

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Since 1986, the Earth System Research Laboratory and its predecessor (CMDL) have been making weekly balloon ozone soundings at the South Pole Station in Antarctica. During the springtime ozone hole period, the sounding frequency is increased to 2-3 per week. The purpose of this paper is to report on the 2007 springtime ozone hole and compare it to past events. The severity of south polar ozone depletion depends on wintertime stratospheric temperatures, stability of the polar vortex, and active chlorine levels. The 2007 minimum total column ozone at South Pole was 125 Dobson Units measured on 8 October 2007. On a year by year basis, 2007 was the 15th lowest minimum observed over the 22 year record. However, the layer between 14 and 21 km showed a typical 95% loss of ozone. In contrast, the 2006 minimum total column ozone was the third lowest at 93 Dobson units (9 October 2006) and showed 99% ozone destruction in the 14-21 km layer. Owing to variations in meteorology and stability of the polar vortex, year to year variations in the severity of the ozone hole of this magnitude are expected. Delays in the transport of ozone-depleting halogens into the south polar vortex region suggest that recovery of Antarctic ozone should take longer than at mid-latitudes. In addition, since the ozone depletion process is saturated in the 14-21 km region, it will take longer for this region to show evidence for the beginning of recovery and other regions must be examined. Detailed analysis of the 22-year record will be used to search for early signs of the beginning of ozone hole recovery.