

EVOLUTION OF ANTARCTIC OZONE HOLE: 1979-2000

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During recent years, Antarctic ozone holes differ in most important features from those observed previously. Using TOMS column ozone measurements made since 1979 as well as ozonesonde measurements in the Antarctic, ozone holes observed in different years have been intercompared with regard to their area, evolution kinetics, column ozone minimums, shape and center position, rotation rate, the extension of ozone anomalies over middle latitudes etc. By a combination of its features, the 1998 ozone hole seems to be the most significant one. However, the 2000 ozone hole was also marked by several record characteristics - the area, the earliest ever onset, and the largest extension over a 50-55 S latitudinal belt. We believe that the basic features of the Antarctic ozone hole are: 1) the local minimum in seasonal column ozone variability where a maximum must be expected by analogy with its seasonal variability in middle latitudes and the high latitudes of the Northern Hemisphere (the fact established by G.M.B. Dobson as early as 1950's) and 2) the local minimum in the vertical profile of ozone mixing ratio at a 15-20-km level in contrast to a monotone increase to be expected. The other specific features observed proceed from the previous two ones. These basic features had never been observed in the Northern Hemisphere. Satellite-borne data clearly showed the Antarctic ozone hole back in 1970's. Based on the data obtained we infer that the evolution of the Antarctic ozone hole is much more governed by the evolution of meteorological parameters in the upper atmosphere than by the increase in chlorofluorocarbon concentrations there. The work is supported by RFBI Projects 99-05-64977 and 00-05-64152.