

YEAR-TO-YEAR CHANGES OF MONTHLY MEAN ZONAL  
WINDS IN THE ANTARCTIC STRATOSPHERE:  
A RELATION TO THE OZONE HOLE (ABSTRACT)

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Dynamical effects on the development of the Antarctic ozone hole have been investigated through the analysis of interannual variations of the monthly mean zonal winds in the Southern Hemisphere (SH) stratosphere using the NMC (National Meteorological Centre, USA) analyzed geopotential height data below 50 mb and above it, United Kingdom Meteorological Observatory (UKMO) analyzed temperature data, from which geopotential heights are calculated. It is found that the year-to-year changes of the mean zonal winds in SH winter and spring (August, September and October) in that lower stratosphere have shown no clear trends during the period from 1980 to 1988, in contrast to the ozone depletion and temperature decline. However, there are apparent differences in the zonal wind comparison between the 1980's and the early 1970's which are cited from the new CIRA model compiled by BARNETT and CORNEY (1985, Handbook for MAP, Vol. 16, 47). The difference in the Antarctic lower stratosphere in winter and spring is evident as the zonal winds poleward (equatorward) of 60°S become weaker (stronger) in the 1980's by over 10 m/s than in the early 1970's. These results indicate that the dynamical condition for the development of the ozone hole, less poleward transport of heat and ozone by planetary waves, was already established at the appearance of the ozone hole in about 1980, and still exists.

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