There is consistency among the trends in zonal-mean temperature, zonal-mean zonal wind, and total ozone, but they differ in the trend for the period 2000 to 2004, while the REF2 shows a change in the trend for that period. Much less important. It is likely that the large variation in wave flux masked the effects of the ozone loss and greenhouse gases. Mapping Spectrometer (TOMS), although the year-to-year variation is different from the observation owing to the internal variability of the climate system.

A CCM Simulation of the Change in Stratospheric Ozone, Temperature, Zonal-wind, and Breakup Date of the Antarctic Polar Vortex in the Years 1980-2004

H. Akiyoshi1, L. B. Zhou1,2, Y. Yamashita3,4, K. Sakamoto1,4, M. Yoshiki5, T. Nagashima1, M. Takahashi3, J. Kurokawa6,1, M. Takigawa7, and T. Imamura1

1 National Institute for Environmental Studies, Tsukuba, Ibaraki 305-8506, JAPAN (hakiyosi@nies.go.jp)
2 LAPC & LAOR, Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, 100029, CHINA
3 Center for Climate System Research, University of Tokyo, JAPAN
4 Now at JMA, Tokyo, JAPAN
5 Present address: JMA, Tokyo, JAPAN
6 Fujitsu FIP Corporation, JAPAN, now at NIES, JAPAN
7 Frontier Research System for Global Change, JAPAN

Abstract

The changes in breakup time of the Antarctic polar vortex in the years 1980-2004 are examined using the output of Chemistry-Climate Model (CCM) calculations, data from the National Centers for Environmental Prediction (NCEP)/National Center for Atmospheric Research (NCAR)/NCEP/NCAR Re-Analysis (ERA40). The CCM used in this study is from the Center for Climate System Research/National Institute for Environmental Studies (CCS/NIES). The CCM are calculated with three ensemble members for REF1 scenario of the Chemistry Climate Model Validation (CVM) and the one ensemble member for the REF2 scenario.

The CCM well simulates the development of the ozone hole from 1974 to 1999 as observed with a Total Ozone Mapping Spectrometer (TOMS), although the year-to-year variation is different from the observation owing to the internal variability of CAM and the ozone decreasing trends of CAM in the two ensemble members of REF1 are underestimated. It is noted that the trends in temperature and ozone trends at polar vortex are consistent with the observations. There is consistency among the trends in zonal-mean temperature, zonal-mean zonal wind, and total ozone, but they differ in the trend for the period 2000 to 2004, while the REF2 shows a change in the trend for that period. It is likely that the large variation in wave flux masked the effects of the ozone loss and greenhouse gases. Mapping Spectrometer (TOMS), although the year-to-year variation is different from the observation owing to the internal variability of the climate system.

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