troscopy in the visible region. To NO_2 profiles between the altitudes 21 and 35 km were deduced from the data obtained during sunset and sunrise. These profiles resemble each other, representing a peak at 26 km a valley at 23 km, and the mean densities at 21, 23, 26, 30, and 35 km are 5×10^9, 3×10^9, 4.5×10^9, 3×10^9 and 1.5×10^9 cm^{-3}, respectively. The profile above the peak is similar to other NO_2 profiles obtained at middle latitudes in the past, but that below the peak differs from them. The wind data at Syowa Station show that there were a strong equatorward wind below an altitude of 25 km and a weak poleward wind above 25 km on the day of the experiment. The peculiar shape of the lower part of the profile seems to be due to the air mass transported from higher latitudes, since there was a sunlit condition around the pole and the stratosphere must have been rich in NO_2.

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GROUND-BASED OBSERVATION OF THE ATMOSPHERIC NO_2 ABUNDANCE AT SYOWA STATION (Abstract)

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The atmospheric NO_2 abundance was measured by ground-based solar visible absorption spectroscopy using the sun and the moon as a light source from Syowa Station, Antarctica (69.0°S, 39.6°E). The observation covered the period from March 1983 to January 1984. The tropospheric component in the measured atmospheric NO_2 abundance was found to be negligible in comparison with the stratospheric one by analyzing the data obtained at solar zenith angle of about 90°. Seasonal variation is clearly seen in the daytime vertical column abundance of the stratospheric NO_2; a summer maximum of about 7×10^{15} cm^{-2} and a winter minimum of $<1\times10^{15}$ cm^{-2}. This seasonal behavior agrees well with that obtained in the Arctic region (71°N). Although in general the nighttime decay of NO_2 is recognized in the data during the autumn and the winter, diurnal variations in NO_2 are smaller than those at mid-latitudes. As for the spring and the summer data, diurnal variations in NO_2 could not be observed, because only sunrise or sunset observations could be made during those periods. There exist large day-to-day variations in the vertical column abundance of NO_2. This fact implies that horizontal transport of airmass plays an important role in the polar stratosphere. The nighttime abundance of the stratospheric NO_2 seems to show a similar variation to the daytime one, but only a few measurements were made in the night and further studies will be needed.

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