

AIRCRAFT MEASUREMENTS OF ATMOSPHERIC CO₂
CONCENTRATION OVER THE ANTARCTIC REGION
(ABSTRACT)

Takakiyo NAKAZAWA¹, Shohei MURAYAMA¹, Masayuki TANAKA¹,
Shuhji AOKI², Takashi YAMANOUCI², Sadao KAWAGUCHI²,
Masashi FUKABORI³, Masataka SHIOBARA³ and
Yukio MAKINO³

¹*Center for Atmospheric and Oceanic Studies, Faculty of Science,
Tohoku University, Aramaki Aoba, Aoba-ku, Sendai 980*

²*National Institute of Polar Research, 9-10, Kaga 1-chome, Itabashi-ku,
Tokyo 173*

³*Meteorological Research Institute, 1-1, Nagamine, Tsukuba 305*

Aircraft measurements of the atmospheric CO₂ concentration over Syowa Station (69°00'S, 39°35'E), Antarctica have been continued since January 1983, except in 1985 and 1988. Since the data obtained so far are still insufficient and the measurements were not made in all seasons of all years, there is some uncertainty in the results. Nevertheless, preliminary inspection of the data shows that: (1) the maximum and minimum concentrations of the average seasonal CO₂ cycle in the lower and middle troposphere appear early in October and in mid-April, respectively; (2) in the upper troposphere, the maximum and minimum occur late in September and early in May, respectively; (3) the peak-to-peak amplitude of the seasonal cycle decreases slightly with height except near the ground surface; (4) the CO₂ concentration increases gradually with height the year and the height-dependent difference of the concentration is smaller in austral winter and spring than in remaining seasons of the year.

From comparison with the results of ground-fixed measurements at the South Pole and Cape Grim, Tasmania and other aircraft measurements, it is suggested that the northern hemispheric air with high CO₂ concentration is transported to the Antarctic region through the upper troposphere from austral winter to spring, while air with low CO₂ concentration is transported from southern middle latitudes into the Antarctic region through the lower troposphere in remaining seasons.

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