

AAS001-02

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## 民間航空機で観測された上部対流圏・下部成層圏CO<sub>2</sub>の広域分布

### Global distribution of CO<sub>2</sub> in upper troposphere and lower stratosphere obtained by commercial aircraft observations

澤 庸介<sup>1\*</sup>, 町田 敏暢<sup>2</sup>, 松枝 秀和<sup>1</sup>

Yousuke Sawa<sup>1\*</sup>, Toshinobu Machida<sup>2</sup>, Hidekazu Matsueda<sup>1</sup>

<sup>1</sup>気象研究所 地球化学研究部, <sup>2</sup>国立環境研究所

<sup>1</sup>Meteorological Research Institute, <sup>2</sup>NIES

We analyzed CO<sub>2</sub> distributions in the upper troposphere and the lower stratosphere obtained by Comprehensive Observation Network for TRace gases by AirLiner. More than 2 million in-situ CO<sub>2</sub> data from more than 3000 flights between Japan and Europe, North America, Australia, or Asia were collected during the period from November 2005 to November 2009. Observed mixing ratios were integrated in equivalent latitude and potential temperature grid for a reference year of 2008 to plot climatological distributions of CO<sub>2</sub>. In the mid-, high latitudinal regions between Japan and Europe or North America, seasonal cycles with summer maximum and spring minimum were observed in lower stratosphere. Tropospheric CO<sub>2</sub> in these latitudinal bands showed strong seasonal cycles with springtime maximums and relatively sharp minimum in July. Longitudinal differences in CO<sub>2</sub> mixing ratios in the upper troposphere and lower stratosphere were relatively small but significant differences were found in the summer season at the potential temperature range of 340-350 K; lower CO<sub>2</sub> over the southern Eurasian continent and higher mixing ratios over the Northern Pacific. These differences may reflect the strength of CO<sub>2</sub> sink at the surface and its transport to the upper altitudes. CO<sub>2</sub> cross sections by using the flights between Japan and Australia or Southeast Asia show spread of high mixing ratios from the Northern Hemisphere to the Southern Hemisphere from April to June in the upper troposphere. This transport brings a unique seasonal peak in autumn in the Southern Hemisphere.

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Keywords: CO<sub>2</sub>, aircraft observation