**Measurements of $CO_2$ Mixing Ratio In and Above the PBL Over the Forested Area in Siberia**

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To understand the difference in $CO_2$ behavior between the planetary boundary layer (PBL) and the free troposphere, we conducted $CO_2$ measurements using a small aircraft and a tower in the forested area in Western Siberia.

Continuous $CO_2$ measurements were conducted at the radio communication tower (90-m height) located in the village of Berezorechka (56°N, 84°E) beginning in October 2001. $CO_2$ mixing ratios at 80 m, 40 m, 20 m and 5 m were measured every 30 minutes. Ambient air was automatically filled into cylinders up to 0.5 MPa and used as a reference gas to cancel the zero drift of the non-dispersive infrared analyzer (NDIR). Thus three standard gases are used only twice per day and can be maintained more than 3 years.

A $CO_2$ measurement device based on a single-cell NDIR equipped with a pressure-regulation system was developed and installed in a small aircraft (An-2). Two standard gases were introduced into the NDIR every 5 minutes. The aircraft ascended to 2 km above the Berezorechka tower and then descended to 0.15 km to get the vertical profiles of $CO_2$. The aircraft measurements have been conducted every 1-3 weeks since October 2001 (Figure 1).

We present our preliminary results obtained from 2002 to 2003 and discuss the differences in seasonal variations at each altitude level.

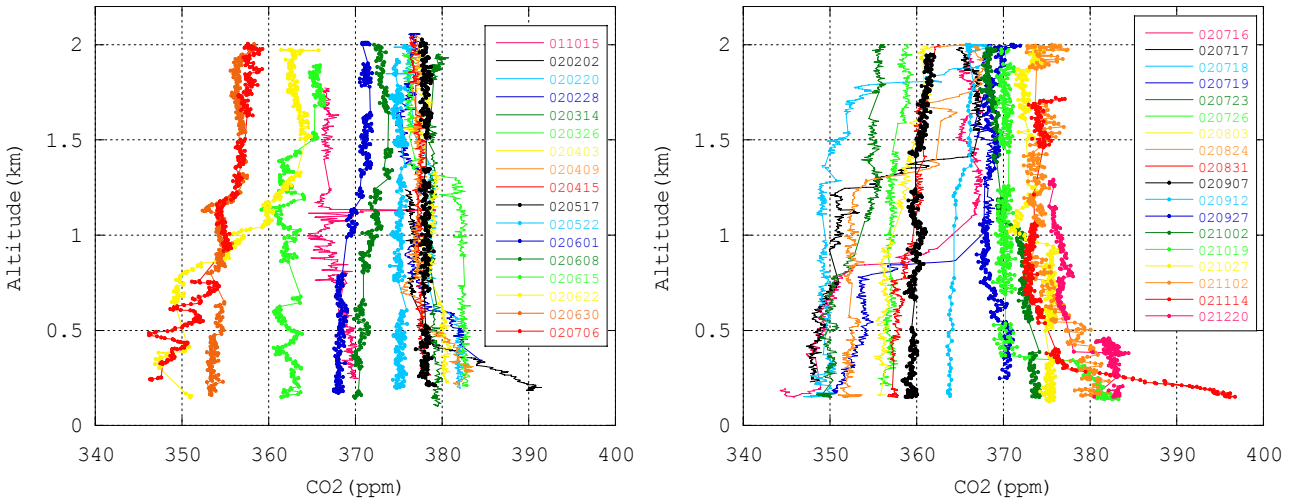


Figure 1. Vertical profiles of $CO_2$ mixing ratio observed over Berezorechka from October 2001 to December 2002.