

In situ measurement of soil carbon monoxide flux in temperate forest

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Carbon monoxide plays an important role in the tropospheric chemistry via its reaction with the OH radical. Soil uptake of CO is a sink of secondary importance, except for the chemical reaction with the OH. However, no reports are available on soil CO flux continuously measured in the field of forest. Therefore, it is still unknown about the dynamics of CO in the temperate forest ecosystem, especially the response to the micrometeorological and soil environmental change. In this study, we intended to clarify the effects of the differences of the soil environment by measuring soil CO flux with the closed-chamber method and a laser spectrometer.

Soil CO flux was observed in Kiryu hydrological study site (KEW), in Shiga Prefecture, Japan. KEW has 55-year-old cypress forests. Priority species of the forest floor is *Eurya japonica* growing sparsely. CO fluxes between soil surface and the atmosphere were measured using the closed chambers, in which changes in CO concentration during the chamber closure were monitored in-situ with the laser spectrometer. Three chambers were set up in three locations under different soil environment. Also, the soil moisture content and soil temperature in the three plots were measured.

We found a significant absorption of atmospheric CO by soil surface. Focusing on the differences with the plot, less absorption was found in the plot of less humus layer. More CO absorption was observed when the CO concentration of surrounding area was high.