Development of monitoring methods of greenhouse gas flux in terrestrial ecosystems.

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We introduced our new analytical system for atmospheric greenhouse (3 species: methane, nitrous oxide and carbon dioxide) gas measurement. In this session, we mention about some examples of observations using the analytical system, and we explain about points of advantages and disadvantages on the system.

In this report, we show an anlytical system developed by our institute to measure 3 species of greenhouse gases emitted from terrestrial ecosystem with ease and with high frequency.

As greenhouse gas emissions from terrestrial ecosystems are controlled by several parameters (soil properties, vegetations, land use, etc.), it is necessary to correct each parameters including gas flux, etc. on each site for global greenhouse gas flux estimation through structuring estimation models. The objective of our study is to serve innovative analytical system for on-site measurement of greenhouse gases.

Our system is based on conventional methods of gas sampling, extraction from glass vial bottles and gas separation by Gas Chromatograph. New points are following,

(1)Fully automated gas extraction from glass vial bottles.

(2)Simaultaneous measurement of 3 species of greenhouse gases by one injection within 10 minutes.

The first point was done by modification of head space sampler (Shimadzu HSS-2B) while the second was restructuring of column separation designation and adoption of helium carrier gas with using doping gas for N2O detection by ECD.

This system is now in patent pending.