

## An analysis of CO<sub>2</sub> concentration variation using inverted surface fluxes

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CO<sub>2</sub> is the main cause of the global warming and there are several methods to study for the circulation of CO<sub>2</sub>. The inverse method is one of these methods. It uses an atmospheric transport model to estimate CO<sub>2</sub> surface fluxes from atmospheric measurements. Recently, many atmospheric measurements of CO<sub>2</sub> are newly available and these are expected to be used for CO<sub>2</sub> inversion. Especially, measurements at upper troposphere by JAL airplane are remarkably extended and expected to impact on CO<sub>2</sub> inversion.

This study is intended to evaluate whether our transport model has an enough performance to simulate the variation of CO<sub>2</sub> concentration at upper troposphere and be able to include these CO<sub>2</sub> concentration measurements into the inversion analysis. Furthermore we analyze the seasonal variation of CO<sub>2</sub> concentration at each latitude in the upper troposphere and try to understand what process effects on these variations.

First we make CO<sub>2</sub> surface fluxes by the inverse method and then perform a CO<sub>2</sub> transport experiment using these inverted fluxes and the tracer transport model based on NICAM.