



Comparison of CO₂ fluxes from mixing ratio and mass density with a closed-path gas analyzer

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The new type closed-path CO₂/H₂O infrared gas analyzer (LI-7200, LI-COR) enables us to calculate CO₂ fluxes from both mixing ratio and mass density of CO₂. The analyzer allows us to do this because it measures both temperature and pressure in the cell simultaneously with concentration of CO₂. After WPL correction was applied, both fluxes were almost in accord with each other. However, CO₂ flux from mass density with the WPL correction tended to be slightly larger than that from mixing ratio, which resulted in a significant difference in cumulative CO₂ fluxes. This difference was explained by the pressure covariance term, which is omitted in the WPL correction. In other words, it was experimentally confirmed that the measurement of CO₂ flux from mixing ratio was consistent with that from mass density with the WPL correction including the pressure covariance term. Therefore, the mixing ratio is preferable for calculation of CO₂ flux with a closed-path gas analyzer.