

Interactive comment on “Measurements of greenhouse gases at Beromünster tall tower station in Switzerland” by T. A. Berhanu et al.

Anonymous Referee #2

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General review:

The last decade has seen an unprecedented rise in greenhouse gases in the atmosphere mostly due to anthropogenic activities. In order to cutback on the greenhouse gas emissions we need to calculate accurately the greenhouse gas budget. The paper being reviewed here delineates a fine approach in that direction. The paper describes measurements from an old radio tower in Switzerland. Tall tower measurements as has been correctly pointed out in the paper are not effected by local fluxes, suitable for investigating the well-mixed boundary layer, constraining regional scale greenhouse gas fluxes. The paper describes further details about the tower project about the five sampling heights at which the tower measures the greenhouse gases and other meteorological variables. The intricate details about the experimental set up in the tower

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are also described in details. A novel approach using multiple linear regression model to amend the temperature and instrumental biases for target gas and ambient measurements has been explained. The time series for carbon dioxide shows a maximum during winter months and a minimum during summer clearly depicting the biogenic uptake. The time series of CO shows a minimum in summer as expected due to the seasonal variation of OH radical.

Major recommendation to be accepted:

The experiments as described in the paper should be carried out in an air-conditioned room. The results in the paper clearly show that there are considerably large differences in CO mixing ratios obtained by simple calibration method and the novel multiple linear regression method. The paper ascribes these differences to a 'stronger temperature effect' of CO than either CO₂ or CH₄. However as a reviewer I feel this needs to be verified by carrying out the experiments in an air-conditioned room and observe whether the large differences in values for CO mixing ratios still persist.

Minor recommendations:

The terms 'high span' and 'low span', 'target gas' are used frequently in the paper. However these terminologies not used universally so these terms need to be explained in the paper.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 10793, 2015.

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