Biogeosciences Discuss., 4, S13–S15, 2007
www.biogeosciences-discuss.net/4/S13/2007/
© Author(s) 2007. This work is licensed
under a Creative Commons License.

Biogeosciences Discussions

Interactive comment on "Methanol exchange between grassland and the atmosphere" *by* A. Brunner et al.

Anonymous Referee #2

Received and published: 12 February 2007

Methanol exchange between grassland and the atmosphere by A. Brunner, C. Ammann, A. Neftel, and C. Spirig.

The authors show data regarding methanol emissions from an intensively and an extensively used hayfield, respectively. Fluxes of methanol, water, and carbon dioxide are shown together with meteorological data. The methanol emissions from the extensively used field are found to be higher which is attributed to differences between plant covers. Furthermore methanol emissions increased temporarily during cutting events. Comparing these temporal increases to the basal emissions over the vegetative period let the authors conclude that the impact of such a cutting event on the methanol emission on the cumulative emissions is of minor importance. Quite good relations were observed for methanol emissions and water efflux from the field with the latter being

assumed to be preponderant due to transpiration. Based on this observation the authors defined a quotient representing the ratio of methanol emission over water efflux. This quotient was found to decrease with increasing LAI. This behaviour is explained by a decrease of methanol emissions with increasing maturity of the leaves. These data were fitted to find a simple empirical parameterisation able to describe the diurnal variation of methanol emission as well as its long-term development during the growing phase.

This is a interesting manuscript and a good contribution to Biogeosciences. The text is well structured and written in a manner making it easy to follow the authors line of arguments. Many measurements were conducted over a time period of about 3 month and therefore the presented results are based on abundant data. The long time measurements showing the steady decrease of methanol emissions with increasing maturity of the plants are original and new. The parameterisation of the long time behaviour by relating methanol emissions to water fluxes is helpful to find better estimates of VOC budgets in the Troposphere.

I recommend publication of this manuscript. There are only some minor points that should be considered.

The CO2 exchange between grassland and atmosphere was studied using the Eddy covariance method. Hence, the net ecosystem CO2 exchange was measured and not the assimilation. The net ecosystem CO2 exchange is determined by activity of soil organisms as well as activity of the plants covering the soil. On the other hand it is assumed that the methanol emissions predominantly originate from the plants. Both together suggests that any relationship between methanol fluxes and CO2 fluxes would be fortuitous. I therefore propose to delete the comparison between methanol fluxes and CO2 fluxes.

There is a problem with figure 11. Figure 11 shows several spikes in the line demonstrating the calculated methanol emissions. These calculations are based on equation

BGD
4, S13–S15, 2007

EGU

4 which is a uniformly continuous function. Therefore spikes as shown in figure 11 are only possible if the water efflux from the field exhibits such spikes. This seems highly improbable and hints to some outliers in the water vapour measurements. If so, this should be mentioned.

There are some typing errors: Page 148, references, name of first author is Obendorf not Oberdorf Subheading Table 2: check comma at Sum(Rg)

Interactive comment on Biogeosciences Discuss., 4, 125, 2007.