**Biogeosciences
Discussions**

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

Anonymous Referee #3

Received and published: 10 February 2007

The paper summarizes methanol emissions from grasslands. Methanol exhibits the highest burden of all VOCs in the atmosphere. A better understanding of sources and sinks is therefore an important contribution to atmospheric research. The paper makes an attempt on parameterizing methanol fluxes on an intensively and an extensively managed grassland. As such the paper merits publication after addressing specific comments listed below.

Section 2.3: Eddy covariance method: As I understand, the eddy covariance method calculates the covariance between the instantaneous fluctuation of a scalar and the vertical wind velocity. Here, the authors interpolate the concentration dataset between consecutive datapoints (e.g. 0.7-1.3s) and calculate the covariance in a subsequent step (e.g. eq. 1). This is mathematically not consistent and probably biases the flux

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

EGU

calculations on longer time intervals. The flux calculation should be performed for the true (non interpolated) dataset. This bias could be much more than corrections made due to high-frequency damping described later on.

Page 138, line 20 cc: How does advection influence the concentration fluctuation?

Page 138, line 25: change to: "methanol flux on the order of 0.1 nmol/m2/s"

Section 4.2: How do these fluxes compare to measurements reported by Schade and Custer (Atmospheric Environment, Volume 38, Issue 36, November 2004, Pages 6105-6114)? Can methanol emissions from soil be ignored or could they contribute a significant amount to the methanol flux?

Page 140: Line 17: statement 'graminoids are low methanol emitters"; include reference

Section 4.3: Figure 6 and eq. 3. It would be more helpful to plot y(t) vs LAI, since this is used to parameterize the flux model.

Page 143/144: line 25 cc: Why compare only the intensively managed grassland to Galbally and Kirstine? Galbally and Kirstine (2002) assume that natural grasslands dominate on a global scale. Therefore I would suspect that the extensively managed grassland would be more realistic to compare with Galbally and Kirstine (2002).

Page 144, line 10: Methanol fluxes at night. What about the storage term? Wouldn't the storage term be more important than the turbulent term during nighttime?

Table 3: I recommend adding a column in Table 3 that states which method was used to infer methanol fluxes for each study.

Figure 11: Present same analysis for extensive field and add a second panel showing how the model reproduces methanol emissions from the extensive field.

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