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Biogeosciences Discussions

Interactive comment on "Eddy covariance flux measurements confirm extreme CH_4 emissions from a Swiss hydropower reservoir and resolve their short-term variability" *by* W. Eugster et al.

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Review of Eugster et al. Eddy covariance flux measurements confirm extreme CH4 emissions from a Swiss hydropower reservoir and resolve their short-term variability BG

In the present debate on greenhouse gas budgets of hydropower, this is an important contribution to the topic. As the first eddy covariance measurements of CH4 fluxes in an aquatic system the study is particularly innovative. The dataset is well presented, analysed and validated. These data should be published in BG. However I find the ms much too long, the statistical analysis with physical drivers quiet heavy, difficult to

follow and not that convincing: correlations are weak even after log transformation of the CH4 flux. I could not understand Figure 7, is this correlation of the CH4 FLUX with the other variable? How do you analyse the effect of level change, when the eddy fluxes are data coming from water bodies with different depths? The fact that ebullition dominates could be demonstrated in a much simpler way if concentrations of CH4 in surface water have been measured, diffusion could be calculated. If not, the wind speed and flux data allow calculate the theoretical surface water CH4 concentration necessary for diffusion to account for all the flux. This computed concentration should be unrealistically high in oxic water, proving that ebullition dominates.

I agree on the fact that allochtounous POC input alone can fuel the CH4 flux. The MS would gain by strengthening the last part of the discussion, in comparison with other younger reservoirs where the flooded biomass is believed to be the major C source.

Explain what variables affect the calculated footprint

P5021L15-19 Schulze et al 2009 did not include waters but Schulze et al 2010 GCB did

Fig2 %time for each wind direction could be added for better understanding

Interactive comment on Biogeosciences Discuss., 8, 5019, 2011.