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Turbulent CO_2 and H_2O fluxes measurements over a wheat field in the Upper Rhine Valley

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Following the outputs of regional climatic models, the impact of climate change in the southern Rhine valley in Central Europe will result in hotter and dryer summer seasons. Which yield and carbon stock changes (in relation to the sense of the protocol of Kyoto) will result from these modifications in water plant supply? In order to assess the impacts of climate changes on the vegetation in the upper Rhine Valley, the project aims at carbon budgets establishment for different plants (wheat, pine, maize) submitted to similar meteorological conditions. In this framework, turbulent CO_2 and H_2O fluxes measurement campaigns over a wheat field close to Hohengoeft village (48^o 40' N, 7^o 29' E, alt.: 220 m., France) have been undertaken in April 2005 and will ended in 2007.

The turbulent fluxes are determined with a CSAT3 sonic anemometer and a LICOR 7500 infrared gas analyzer at a frequency of 20 Hz. Climatological variables are measured in the air (radiation, temperature, humidity, wind, precipitation) and in the soil (temperature, water content, water tension). To improve the quality of the data set, some corrections (Webb, Schotanus, statistical....) are used and the fluxes are calculated at a 30 minute time step.

The first results of this measuring campaign will be presented. The dynamic of CO_2

and H_2O concentrations and fluxes at daily and seasonal time steps will be discussed in relation to the climatological patterns. The soil heat flux and the net radiation will be presented separately and by calculating the energy balance closure (EBC).