# Construction and first tests of a REA system for carbonyl compounds and improvements in the HPLC procedure

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Investigation on the fluxes of carbonyl compounds has been attracting a great interest because carbonyl compounds can be emitted directly from biogenic sources (e.g. trees and grassland) or produced by oxidation of hydrocarbons in the troposphere.

To be able to determine the fluxes of biogenically emitted carbonyl compounds we developed a Relaxed Eddy Accumulation System (REA). The system consists of a 3-dimensional sonic anemometer, a conditional sampling device and a computer. The sonic anemometer gives information about the wind components (u, v and w), the speed of sound and thus the virtual temperature.

With the help of a LabView program the vertical wind fluctuations can be recorded and averaged over 1 hour. The deadband can be calculated from the standard deviation of the vertical wind fluctuation which is then used to make the system relaxed. The sampling device is controlled by the LabView program. The fast solenoids respond to the fluctuations of the vertical wind velocity and the sampling regarding to the vertical fluctuations can be performed.

The sampling is performed with DNPH-coated silica gel cartridges. After sampling the excess DNPH is removed by 2*1.5 ml of water. The DNPH derivatives are eluted by 3 ml acetonitrile. The sample is evaporated at moderate temperatures using a nitrogen stream to 0.5 ml to obtain a concentrated solution without disturbances of the HPLC analysis by the non-processed DNPH. With this procedure we have improved the detection limit noticeably to ???ng m-3 at a sampling volume of ???l for most compounds.