



## **A comparison experiment between open and closed path eddy covariance devices using an integrated open path sensor**

Patrick Hogan, Juraj Parajka, and Günter Blöschl

Vienna University of Technology, Centre for Water Resource Systems, Vienna, Austria

The eddy covariance method has become one of the most common methods for measuring evaporation and carbon dioxide fluxes as it makes direct measurements and can be used at different spatial scales. Eddy covariance measurement devices are divided into two different designs, designated open path and closed path depending on where the gas of interest is measured. There is currently no preferred eddy covariance design, with the decision on which design to use usually based on the local precipitation conditions and power availability. A recent long term field comparison by Haslwanter et al. (2009) found differences in the measured and corrected evaporation between the different designs, with the largest differences in the latent heat flux occurring during periods of above average meteorological conditions.

All previous comparison studies have been performed using the LI-7500 OP analyser which must be placed a distance away from the closed path intake and the path of the sonic anemometer. This must be accounted for by including corrections for high frequency filtering and sensor heating. The objective of this study is to use the IRGASON open-path design from Campbell Scientific where the gas analyser and sonic anemometer will be directly aligned with the intake to a closed path sensor to compare the different sensor designs. The measurements will be performed at the HOAL catchment at Petzenkirchen, Austria, which is equipped with a weather and energy balance station as well as an extensive soil moisture network to measure evaporation.

This project will perform a comparison between open path and closed path eddy covariance systems using a new integrated open path design. The measurements will then be used to study the differences between the corrections required for the different designs and the effects of meteorological variables on the measured latent heat fluxes to address the issue of open and closed path gas analyser comparisons.