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Micrometeorology at a scale of a lysimeter

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With a lysimeter the evaporation of water can be determined from a soil structure directly by weighing.
Other variables, such as the exchange of trace gases (including CO_2) between the lysimeter and the atmosphere are determined by specific probes (chambers), which are often placed on the lysimeter itself. This, in turn, may lead to interferences with the structure of the atmosphere in its interaction with the surface of the lysimeter.

Meteorological conditions are often measured in the surrounding of the lysimeter where especially flow may differ significantly from the conditions right above the lysimeter surface. Thus, the aim is to control the micrometeorological conditions over the surface of such a lysimeter, without any additional meteorological measurements in the further surroundings and with as little disturbances of the flow field as possible.

In this contribution, the method of an acoustic chamber is presented. The method uses acoustic velocimetry / thermometry for the determination of wind and temperature. By positioning the acoustic transducers (and additional humidity sensors) around the lysimeter, the temperature and flow conditions are recognized directly above the lysimeter. Thus, thermal and flow conditions on the lysimeter are not disturbed by the presence of sensors.