



## **Advances in Evapotranspiration measured with Scintillometry**

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The aim of this presentation will be to review recent developments in scintillometry. Firstly, we will discuss recent progress made in dual-wavelength long-path scintillometry to measure area-averaged evaporation on kilometer scale. Among others, this concerns a 160 GHz radio-wave scintillometer (RWS) combined with an optical scintillometers (OS). Use is made of the fact that scintillations detected at a distance of a radio-wave source are mainly due to water vapor fluctuations, whereas temperature fluctuations are causing primarily scintillations in the optical wavelength region. One of the technical new features is that the so-called Fresnel-zone length scale of the 160 GHz (RWS) and the 30 cm aperture OS become comparable, allowing the direct measurement of the temperature-humidity cross-structure parameter.

In addition, we will present recent progress made with short-path laser scintillometry. Among others, evaporation measurements under regional advective conditions over irrigated alfalfa in Idaho will be shown, as well as water vapor and carbon dioxide flux measurements over 1-min time intervals above a wheat field in Germany. In the latter study use has been made of the fact that the laser-scintillometry is able to observe the turbulence mechanism for vertical transfer of scalars. The audience will be invited to participate in new field campaigns to test the different applications of scintillometry under different environmental conditions.