

## **On the Use of Scintillometry to Close Water and Energy Budget at Parcel and Landscape Scales**



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The interactions between climate and the biosphere are governed by a set of processes operating from the local to the global scale. The field scale and the 'landscape' scale, ranging from  $\text{hm}^2$  to a few tens  $\text{km}^2$ , are suitable for hydrological as well as agricultural issues. This is confirmed by the production of satellite-derived AET products at the  $\text{km}$  scale (MODIS Global Evapotranspiration), by the development of disaggregation methodologies from existing space data, and by attempts to develop high spatial resolution remote sensing systems in the thermal infrared. However, the validation of the energy water and energy exchanges remains difficult at these scales — only scintillometry has been recognized as a suitable technology (at least in the optical domain for sensible heat fluxes). Scintillometry fills the gap between local station networks (demanding in terms of maintenance and monitoring) and airborne eddy covariance methods (difficult to implement, representative of larger scales and incompatible with continuous monitoring). The talk will show how scintillometer data have been used to understand hydrological behavior for specific case studies. One of them concerns West Africa: a region of the world most vulnerable to climate changes, especially for water resources, with the highest demographic rate in the world (3% per year) and still insufficient access to drinkable water. On the southern site of the critical zone AMMA-CATCH observatory, in Benin, scintillometry data have been combined with other hydrological data to close the water budget at catchment scale. Among others, this study aims to make IR scintillometry an operational method to document turbulent fluxes.