



Energy balance at a catchment scale using an infrared scintillometer and soil measurements

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The purpose of the present study is to better understand the interactions between surface and atmosphere at the scale of a small watershed, by estimating the energy balance at the interface.

The potential of the large aperture scintillometer (LAS) is now commonly accepted to estimate sensible heat flux over several kilometers square. Our LAS has been deployed over a small catchment in the north part of Benin, within the AMMA-CATCH project. This very heterogeneous area is composed of little savanna tree, savanna bush and crop patches.

Sensible heat flux is derived from scintillometer and added aerodynamical data along a 2.4 km path. Ground heat flux is estimated using soil measurements along three catenas over the catchment. The net radiation component is directly measured. The estimation of latent heat flux is deduced from soil humidity profile. As no runoff was observed during the dry season, we only have considered vertical transfers.

The results presented here focus on an isolated rainfall event during a three months period of the dry season at a daily time step. The energy balance of this large and very heterogeneous terrain is closed within a 30% range. These results are pretty good keeping in mind that measurements uncertainties are added to each others in that budget method.