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A preliminary assessment of methane fluxes from a tropical rain forest in Africa

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Eestimation of methane fluxes in terrestrial ecosystems is becoming the object of numerous studies in recent years. This is caused from an environmental point of view by the significant impact of this gas on the atmosphere, and from a technical point of view by the development of new tools that allow a proper quantification of such gas, opening the way to new scientific challenges in the estimation of fluxes and their modeling. In this work methane fluxes are measured over and within an African tropical forest through the use of the eddy covariance technique and the new open-path sensor Li-Cor 7700. Near the forest soil, although fluxes are quite low, we measured a net daily sink (around 0.8 nmol m-2 s-1) during the dry season and a net source (2.5 nmol m-2 s-1) during the wet season with morning peaks up to 10 nmol m-2 s-1. Above canopy fluxes seems to be related to the rain frequency. In fact estimates from the first weeks, corresponding to the end of the wet season, show positive fluxes (emission) with peaks that reach 40-50 nmol m-2 s-1. With the diminishing of the precipitations, fluxes decrease and trim around zero with some negative mean values. After an error assessment and a quantification of the minimum detectable flux, issues related to the use of this tool are discussed.