



Shedding light on daytime flux partitioning

Georg Wohlfahrt

University of Innsbruck, Institute of Ecology, Innsbruck, Austria (georg.wohlfahrt@uibk.ac.at)

Flux partitioning, that is disaggregating the measured net ecosystem carbon dioxide exchange into the underlying gross primary productivity (GPP) and ecosystem respiration (ER), has become a key component of the FLUXNET processing chain and the resulting products are widely used by experimentalists and modellers alike.

Here I review flux partitioning based on light response curve modelling, commonly termed the daytime flux partitioning approach. In particular I tackle the question whether daytime flux partitioning is able to account for the reduction in daytime ER relative to nighttime due to the reduction in leaf mitochondrial respiration in the presence of daylight.

To this end I use synthetic data (with realistic noise superimposed) generated (i) by light response curve models upon which a daytime reduction in ER was imposed, (ii) results from a process-oriented soil-vegetation-atmosphere-transfer model, as well as (iii) experimental data from a simple ecosystem, where daytime ER was estimated based on a combination of complementary measurements and a canopy model.