Biogeosciences

Discussions

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Interactive comment on "Predicting landscape-scale CO_2 flux at a pasture and rice paddy with long-term hyperspectral canopy reflectance measurements" *by* J. H. Matthes et al.

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Detailed comments:

"p. 5080, l. 10: spectra are discrete, not continuous; the term "continuous" is used quite frequently throughout the paper – in my view almost no measurements are truly continuous but rather continuous in theory and in practise interrupted by unavoidable gaps; bottom line – I suggest to reconsider the abundant use of the term continuous."

We agree with this comment and have subsequently changed all instances of "continuous" to "quasi-continuous" to indicate that the spectra are indeed comprised of discrete measurements or, where appropriate, used a different adjective to better describe the

data.

"p. 5081, l. 21: actually typically these indices use fairly narrow wavebands, even from satellite platforms"

From our understanding, various satellite platforms vary in the bandwidth used to calculate these metrics; however we have deleted "broad-band" from this sentence to reflect the variability in wavebands width from various platforms.

"p. 5084, l. 1-23: is this paragraph truly necessary – we will anyhow learn later what the authors did to address the four questions"

We believe that outlining the work within the Introduction immediately following the key Research Questions will help the reader to understand the logic for our Methods that follow.

"p. 5088, l. 12: presumably you also applied a coordinate rotation to the wind data"

Yes, we have added the coordinate rotation to the list of corrections applied to the raw data.

"p. 5088, l. 25 and 26: net release and net uptake – uptake and release may be operating at the same time, eddy covariance however only allows measuring the net flux"

Eddy covariance measures the net flux, but we separate uptake (GPP) from release (Reco) by standard methods described in Methods section 2.3 and at length in Knox et al (2014) and Hatala et al (2012), so we feel justified in using the partitioned "uptake" GPP fluxes for our analysis.

"Table 1 and 2: GPP and NEE have different units at instantaneous and other time scales – correct? If so this should be noted in the table legend"

Yes, we have added this information to the Table 1 and 2 legends.

"p. 5099, l. 5-7: rather than representativity, isn't the issue more that the reflection by the white flowers confounds the signal?"

We believe that both the increased spatial variability at the Pasture compared to the Rice, in addition to the white flowers of the canopy, can contribute to a lower predictive power of the reflectance spectrum at this site, and thus we will leave this explanation as is for the time being until further studies help to understand this complexity.

"p. 5099, l. 12: an UAV might be an appropriate tool for sampling the flux footprint"

Yes, we have added this to the list of possible improvements to footprint sampling.

"p. 5102, l. 14: if I am not mistaken, MODIS (Terra and Aqua) yield daily data, which are aggregated into the 8-day GPP product"

Yes, thank you for this important correction and we have modified the manuscript accordingly.

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