

## ***Interactive comment on “Predicting landscape-scale CO<sub>2</sub> flux at a pasture and rice paddy with long-term hyperspectral canopy reflectance measurements” by J. H. Matthes et al.***

### **Anonymous Referee #4**

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General comments: The authors report on a study within which they quantified hyperspectral reflectance and CO<sub>2</sub> fluxes over five years at a pasture and a rice field in California. The main aims of the study are to assess the seasonal and interannual variability in hyperspectral reflectance and the associated links to GPP and NEE. To this end the authors use partial least squares regression modelling. The study relies on an impressive data basis; methods are standard and sound; results are clear and the discussion makes appropriate reference to the pertinent literature; the paper is well written, at times the style could be more concise however. Taken together this study represents a useful addition to the literature and I have only a few smaller comments, listed below.

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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

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

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

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

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

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

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