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Biogeosciences Discussions

Interactive comment on "Estimating carbon dioxide fluxes from temperate mountain grasslands using broad-band vegetation indices" *by* G. Wohlfahrt et al.

Anonymous Referee #1

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This paper explores the use of several vegetative indices for estimating NEE, GPP and Reco. Comparsions are made with results from both indices determined from narrow band spectrometers as will as indices derived from broadband observations of visible (PAR) and total solar radition, both incoming and reflected. Midday values are utilized fitted with various non-linear models. The results show the potential use of both hyperspectral and broadband indices, and how these could be utilized to provide non-biased estimates of GPP or NEE. The paper is generally well written, and should be published upon addressing the more specific comments below.

1. With regard to the two sites, is there any information that could be used to describe

the c3/c4 composition of grasses at these sites? Although some grasses were listed, most grassland sites are a composite of several species. This may explain some of the differences in the derived parameters for the non-linear model.

2. The weak correlation of Reco with the indices is not surprising given that most respiration processes are temperature dependent, although there is probably some correlation of NDVI with seasonal temperature signature. But I would be careful of reading to much into any correlation of Reco with NDVI.

3. When, taking the spectral measurements (average of 5 replicates), what were typical coefficients of variation for the various reflectances?

4. On page 11166, the PAR photon flux conversion 4.55 J/mol should have a citation, there are plenty out there. Also there is a 5% or so uncertainty (or variation) in this conversion factor that should be mentioned. Good analyses on the uncertainty computations.

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