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Interactive comment on "EUROSPEC: at the interface between remote sensing and ecosystem CO_2 flux measurements in Europe" *by* A. Porcar-Castell et al.

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This review of recent EuroSpec advances represents a valuable contribution to the emerging field of integrated optical - flux sampling and to the larger topic of ecosystem monitoring within the context of the global carbon cycle. The paper provides a broad context, nicely summarizes the recent history of EuroSpec and similar efforts elsewhere, and describes the recent formation of the Optimise program to carry the work forward. The manuscript includes a useful and insightful discussion of recent technical advances, helpful critiques of current limitations (e.g. gaps in current international efforts as well as technical challenges), and suggestions for future progress in the field of

proximal remote sensing. It also provides a solid argument for developing a concerted sampling and data approach to better link the flux tower network to remote sensing. Overall, this is a well-written and comprehensive review.

A few points to consider for possible addition/clarification:

Page 13073, line 6 - The statement that optical estimates of fAPAR are affected by canopy structure is not uniformly true for all optical methods. Broadband measurements clearly have trouble, but spectral methods can distinguish green from non-green, using transmitted or reflected light, and this is largely the basis for using vegetation indices like NDVI. However, it is true that ground validation methods of fAPAR (e.g. using light bars based on PAR that do not distinguish color) are often strongly confounded by non-green canopy materials, and the literature has often been vague on this point. So this is probably more of a problem for our ground validation than for our satellite indices.

Page 13073, line 9 – vegetation indices (e.g. NDVI) are more closely related to green fAPAR (i.e. the fraction of PAR absorbed by green canopy material) than total fAPAR, and this should probably be clarified.

Page 13073, lines 22-23 – It may be true that other indices besides NDVI are better related to LAI, but are these any better related to green fAPAR? Green fAPAR, not LAI, is the real concern in the LUE model, so these discussions of saturation and LAI may not so terribly important from this perspective. Since LAI is non-linearly related to fAPAR, LAI may not be a meaningful metric for the LUE model. Given that LAI is ill-defined for much of the world's vegetation (think bryophytes, evergreen conifers, or most desert plants), it may be best to avoid a reliance on LAI-based approaches, at least when determining canopy light absorption. Optical approaches like fAPAR (or NDVI) that can provide a more direct measurement of light absorption by green tissues may actually be more relevant and useful than this discussion of LAI non-linearity suggests.

Page 13073, lines 5-6 – Efficiency variation is considered indirectly through

meteorologically-based variables (which may not be available for a given site).

Page 13081, lines 19-21 - By "averaging out" these effects, aren't bi-hemispherical measurements LESS sensitive to BRDF effects than hemispherical-conical by? Can you provide a citation to support this point?

Page 13085, lines 12-13 - Some brief mention of the panel options here (and their pros/cons) would be helpful. For example, most are made of teflon (PTFE) and users can purchase Spectralon (for a high price) or can make panels from virgin white teflon (at considerable cost savings but slightly reduced performance).

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