

## General comments

The authors aim to provide a comprehensive dataset including multi-site, multi-crop measurements of the water, heat and carbon fluxes as well as the associated parameters in the Soil-Plant-Atmosphere-Continuum system in Germany. When the dataset is unique and complete, and be useful for the scientific community, the describing manuscript, however, is not well organized and is not easy to follow.

Dear Reviewer, thank you for the time and effort put into this review. Based on RC1, we have greatly tightened the structure of the manuscript, deleted redundancies, and made sure that we addressed some missing points, which we do not fully include here. Most importantly, this addresses

- a) Addition of missing text pieces, without which some parts were indeed not that clear
- b) deleted section 2.4, and integrated the relevant parts to where the different environmental compartments are described, namely section 2.3.

With this, we are convinced to have enhanced readability greatly.

Specifically,

1. The manuscript focus too much on the description of the measurement detail (section 2). Nearly a half of the text is on the measurement detail and the site description, the description of the dataset in comparison is very simple. Surely, the measurement detail is very important. However, it can be presented in a better and clear way, such as in a table describing e.g., the specific devices, the measured method and the time duration for each parameter (an extended table 4). Besides, the sub-sections, such as field measurements (2.3), field sampling (2.4) and laboratory measurements (2.5) should be reorganized in a brief and clear way.

DISAGREE partly. Following the journal's scope is to attract "*articles [that] [...] may pertain to the planning, instrumentation, and execution of experiments or collection of data*" which is exactly the scope of our article. Further, the journal's scope is detailed that "*any interpretation of data is outside the scope of regular articles*". We are convinced that we have stringently abided by the scope.

We do agree, that the organisation of the section 2.3, 2.4, and 2.5 deserved improving. As detailed in responding to RC1, we have

- 1) removed section 2.4 and merged it with section 2.3. In section 2.3 we now directly give the details on field sampling methods, as well as on the measurement process for the soil respiration.
- 2) The introduction to section 2 (Material and Methods) now has a) a graphical schema to explain the system, and b) gives a more detailed description and chronological description of the entire section 2.

Thereby, we are convinced that this greatly enhances the readability, structure and overall clarity of the article.

- The authors mixed the data measurement and the data analysis (figures 3-5) together in section 2. It is better to present separately. The authors may also consider extending the data analysis section. Since the manuscript contains so many different data, it is useful for readers to briefly introduce the dynamic of the main parameters and the difference between the two sites.

DISAGREE partly. We just give very global descriptions of the sites as a guide to the readers. our intent is not to repeat any of the currently achieved data analyses.

- For this dataset, many parameters in relation with soil, plant and atmosphere properties were measured. I suggest to include a figure that demonstrates all the parameters measured from soil to atmosphere, including the specific parameter, the observed depth, the time duration and others. This would make the presentation more clearly. Note that this should be in more detail than the figure 1 in the text.

AGREE. Great idea!! We did this by including Figure 2

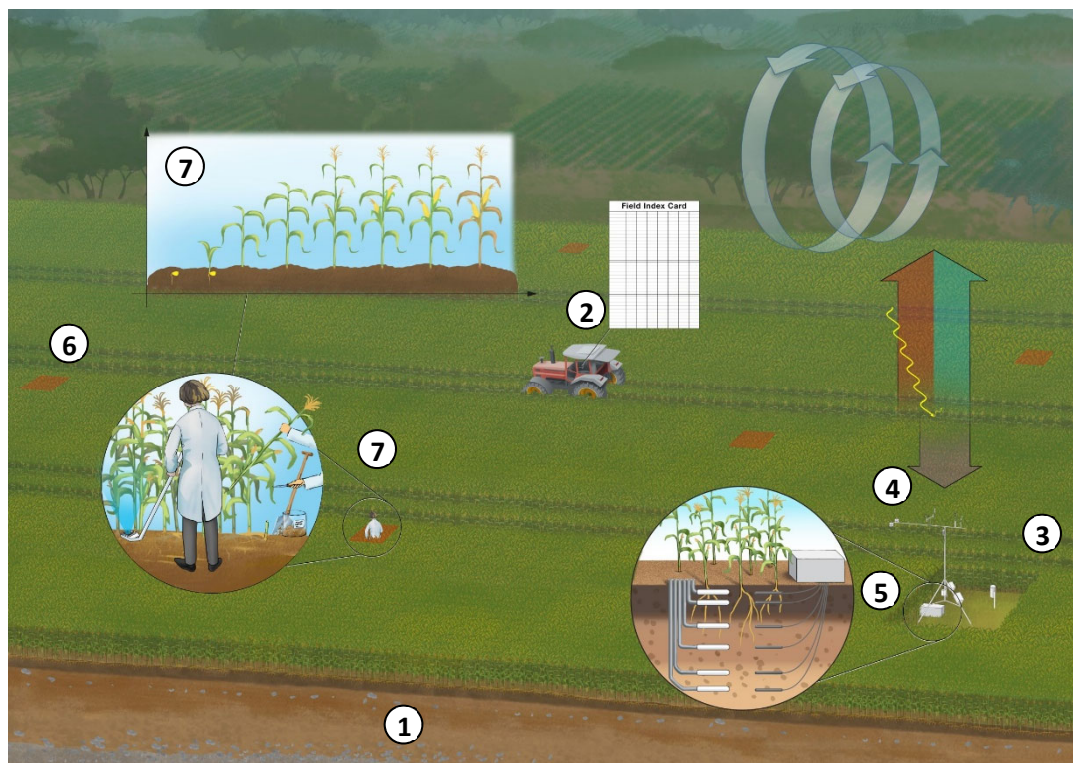


Figure 1: Schema of the core of the measurement campaign at the research sites: 1 - soil profile characteristics, 2 - management and cultivation data (sowing date, harvest date, crop type and variety, fertilisation and pesticide application including amount and type), soil tillage, 3 - meteorological data (rain, air temperature at two meters height, and relative humidity), 4 - soil/biosphere-atmosphere fluxes using fully equipped eddy covariance stations for carbon, energy, and water vapor flux measurements, as well as wind speed and wind direction, 5 - soil state measurements including water content, temperature, and matric potential, the soil profile depth permitting, at 5 cm, 15 cm, 45 cm, 75 cm, 90 cm, 130 cm soil depth, and 6 – five plots per research site for carbon and nitrogen measurements integrated over depths of 0-30 cm, 30-60 cm, 60-90 cm, and 7 - plant performance also determined at the plots (phenology, height, and leaf area index, yield, above ground biomass, carbon and nitrogen in vegetative and generative biomass). Illustration by H. Vanselow (<http://www.holgervanselow.de/>).

4. For the provided dataset (for1695\_data), a description of the data quality should be provided. Also please check the format of the text in the 00\_meatadata file, please provide more information for the calibration equation described in the ec1\_soil\_metadata file.

We understand that this point considers three different aspects.

- 1) data quality
- 2) format of the text in 00\_metadata file
- 3) calibration described in the ec1\_soil\_metadata

ad 1) We have now included a sub-section on uncertainties (2.5).

ad 2) We checked.

ad 3) Done, as detailed in response to RC1

Specific comments

1. P4L15. The description of the dataset in the follow section is better in the same order with the summarize here. For example, the soil characteristics here is in the order of (iv) whereas it is presented firstly in the section 2.

AGREE and a very good point, too. Thanks! This list now follows exactly the order in the Material and Methods section.

2. P7L2. It is better to present Table 1 in the soil measurement section.
3. P11. The author may consider placing the (briefly) data analysis (figures 3-5) in a new data analysis section.

DISAGREE. Thanks for the idea. However, in the introduction and throughout the manuscript, we cite relating manuscript.

4. P14L15. Please complete the description.

AGREED. Done.