We express our gratitude to the editor and the anonymous reviewers for their valuable feedback and for giving us the chance to revise and thereby improve our manuscript entitled: "Validation and field application of a low-cost device to measure CO_2 and ET fluxes." We have thoroughly addressed each comment. For convenience we color coded our responses as follows: black (reviewer comments), green (response), gray/italic (changed text from MS).

The paper presents the laboratory testing for CO_2 flux low-cost sensors (NDIR sensors), and field validation and field application of the same sensors together with evapotranspiration (ET) flux low-cost sensors (Relative Humidity sensors).

The experiments and analyses are very thorough and the paper makes a significant contribution to the low-cost sensor literature for CO_2 and ET fluxes. The authors provide good discussion of their results based on recent literature.

My main comment, in addition to minor edits suggested below, is that the results are sometimes difficult to read, with findings about each category of sensor (CO_2 and ET) being mixed up, and important findings such as the temperature dependency are buried in the text.

I recommend that the authors use subsections and indicate in subtitles which sensors they related to (e.g. l. 351, this should be a separate section for RH sensors). This will avoid some possible confusion, e.g., there was no lab testing for the RH sensors, but it is not clear in how the results are presented.

We created the suggested subsections as follows:

3.2 Field validation

- *3.2.1. In situ ET flux validation*
- *3.2.2. In situ CO_2 flux validation*
- *3.2.3 Temperature- and PAR-dependency of measured CO_2 fluxes*

Minor comments:

Table 1: In a separate section of the table, please add cost of the other NDIR and RH sensors tested (those that were not ultimately used in the field); this information is useful for the emerging low-cost sensor body of literature

As suggested, we added a separate section in the table for the other additional NDIR CO_2 sensors tested as follows:

COST OF OTHER NDIR SENSORS TESTED				
SENSIRION SCD30 MODULE	*1*	*NDIR gas sensor for CO_2 (0-10000 ppm) integrated with humidity and temperature sensor in the same module*	*63.50 Euro*	*www.berrybase.de*
MH-Z14 CO_2 SENSOR MODULE	*1*	*NDIR gas sensor for accurately measuring the CO_2 concentration (0-10000 ppm)*	*55.60 Euro*	*www.kaufland.de*
MH-Z19 CO_2 SENSOR MODULE	*1*	*NDIR gas sensor for accurately measuring the CO_2 concentration (0-10000 ppm)*	*28.50 Euro*	*www.reichelt.de*

Figure 1c: Please add component names to improve readability.

Changed accordingly.

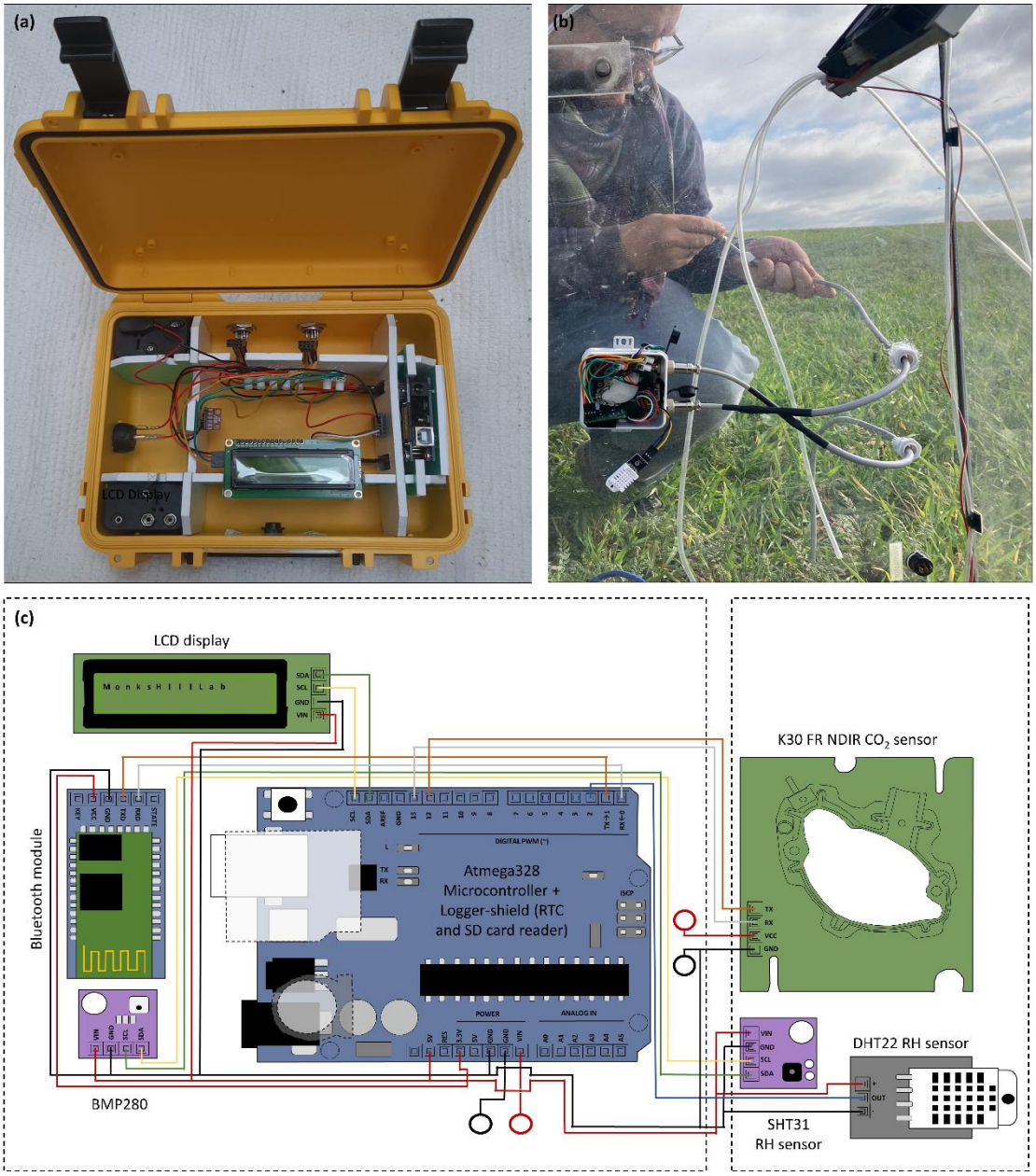

Figure 1: (a) Logger unit in weather and shock resistant housing, (b) external sensor unit attached to a transparent non-flow-through non-steady-state (NFT-NSS) closed chamber and (c) schematic representation of wiring.

Figure 6: Caption should mention SHT31 and DHT22 as RH low cost sensors

SHT31 and DHT22 are now named as RH low-cost sensors in the caption of Figure 6.

l.121: units should be cm^3

Changed accordingly.

l.214: how did the authors identify the starting point for the moving window analysis? or did they use multiple starting points and multiple windows (0.5 to 3 min)?

Indeed multiple moving windows were used (0.5 min to 4 min). The script described in detail by Hoffmann et al. (2015) uses a variable moving window to calculate all possible subsets of a flux measurements and subsequent uses exclusion and quality criteria to identify the final flux. To make this clearer, we added the following to L214:

The variables T and, more importantly, $\Delta c/\Delta t$, were obtained by applying a variable (window size 0.5 to 4 min) moving window to each chamber measurement.

l. 323: Why less CO_2 fluxes could be calculated for the low cost sensors?

Flux calculation of closed chamber measurements needed to pass the same rigorous flux calculation algorithm for all sensors, as described in section 2.5.1. In case of K30 FR and SCD30 especially NEE measurements did not yield in valid flux estimates and thus did not passed this step.

This might be e.g., due to non-significant regression slope, non-linear concentration increase, variance inhomogeneity, outliers or last but not least larger variations in temperature or especially PAR. Since NDIR sensors are passive sensors they have a higher delay time than the LI-850. This can result in a shift of measured PAR and adequate measurement subsets thus attributing a high PAR variation to proper measurements subsets and vice versa during conditions characterized by a persistent change between sunny and cloudy conditions. Hence, as commonly aimed at, measurements should be best performed during sunny conditions.