Both referees agree that the presented comparison of an automated system for soil greenhouse gas analysis with a standard method has been carried out properly and was reasonably well described. However, both raised concerns about the added value of this study over several other publications that have similarly addressed questions on the performance of automated vs. static chamber methods. The authors now provided in their response letter further clarification, and in both responses the main argument raised is that the control of the used gas flow multiplexer is completed by an open-source system. This on its own does not make the current submission very novel. However, reviewer 2 then suggested some ideas to complete the current paper and the authors now propose to add in calculations of the detection limit of either tested method (also in response to reviewer 1s comment). They also propose to expand their analysis with assessing the impact of the sampling time (i.e. hour of the day) and sampling frequency. From a first reading, it is however clear that these extra elements have not yet been taken up into the general conclusion section. The authors are now invited to upload a revised manuscript taking along this comment as well. The authors are also invited to implement other changes (mainly clarifications as requested by the referees) as proposed in the author responses. This revised version will then be presented to referees once more to judge if its content is now indeed novel enough over the current state of the art.

One minor comment: It is more logical to use local time directly and not present all in GMT.

Answer to the Editor:

We are grateful for the editor's feedback. The new version of the manuscript (Manuscript_Automated_R1) provides more detailed answers to the reviewers' comments. We have also replaced GMT times with local time.

C1: The authors present a non-commercial automated chamber system for measurement of soil greenhouse gas fluxes and compare its performance to manual chamber measurements. This is a nice set-up and experimental design presented and such data regarding the performance of automated chamber systems are relevant since automated systems start to become more widespread in greenhouse gas flux studies. However, there are some details and information in the manuscript about the automated chamber system that are either missing or not explained in such a way that I understood them. Also, despite the authors having generated a very good dataset, the discussion could benefit from more depth. I recommend major revision to strengthen this paper for publication.

Answer C1: We really appreciate the Reviewer's comments to improve the quality of the manuscript. Changes in the text are highlighted in yellow.

General comments

C2:The objective of the paper is to present an "innovative non-commercial soil GHG measurement system". However, I did not understand what is exactly new about this system. The 'Queensland design' described has already been in use since 2000 and has been referenced e.g. in the "Nitrous oxide chamber methodology guidelines" by de Klein & Harvey (2015). Please highlight more the innovative updates to the system.

Answer C2: The innovation of our automated chamber system is based on the majority of the electronic components that control the system are devices based on the Arduino system that allows an easy integration in the R script (developed by ourselves) that controls the system. (L170-179)

"This R script, governed by the time taken by the analyser to process the sample, can be easily modified by setting the total number of chambers or, if it is necessary to work by blocks, by setting the number of blocks and the number of chambers per block. One of the advantages of this system is the self-made multiplexer that allows to modify the number of chambers easily compared to other multiplexers like Gasera Multipoint Sampler (Gasera Ltd, Finland) which has a close configuration of 8 or 12 channels. Moreover, the use of relay boards that could be configured by Arduino or easily integrated into the R script as the selected ones, as an alternative to control modules, for example, I-7060D (ICP DAS CO, LTD) that only have four channels per module, simplifies the configuration of the script, since just with one board it's possible to handle all the chambers."

C3: In the abstract and the last paragraph, the authors refer to Mediterranean conditions. I am not sure how important this is with regard to the chamber methodology itself. What are environmental conditions that the automated chambers still have to properly function in which are different from automated chamber studies from other regions? What is challenging about measuring soil GHG fluxes in Mediterranean conditions?

Answer C3: We agree with the Reviewer's comment that the climate conditions, such as Mediterranean conditions, are not an important issue in developing chamber's methodologies.

We modified the abstract and final paragraph of the introduction section. (L35; L92-98)

C4: Lines 268 – 277: This discussion is a bit too vague for me. The authors have started some really good discussion points, but they didn't really explore them further in depth with their data. Instead of saying that the chamber dimensions could explain flux differences, why not use the measurement data to further explore this subject, e.g. by calculating the Minimum Detectable Flux according to Christiansen et al. (2015) and Nickersen (2016). This would be especially interesting for CH4 with fluxes fluctuating around zero. The MDF specifically includes chamber design and chamber closure time. It also includes the analytical precision of the gas analysis system. This is a point I am completely missing here. The authors compare a photoacoustic multi-gas analyzer and a gas chromatograph which differ significantly in their analytical precision. Does this significantly impact the results? A question regarding the effect of air-mixing: Could the fans have flushed out a bit of air from the soil pore system, thus contributing to the higher flux estimates?

Answer C4: We appreciate the Reviewer's comment and we calculate the MDF for both chamber systems. MDF for the automated chamber system were 1.209 mg CO_2-C m^{-2} day^{-1}, 0.012 mg CH_4-C m^{-2} day^{-1} and 0.059 mg N_2O-N m^{-2} day^{-1}, while for the manual chamber system, MDFs values were 14.050 mg CO_2-C m^{-2} day^{-1}, 0.143 mg CH_4-C m^{-2} day^{-1} and 0.071 mg N_2O-N m^{-2} day^{-1}.

Regarding the possible effects of fans on the fluxes estimation due to a flush phenomenon that forces the air coming from the soil to the chamber, in the development test carried out during the chamber set-up, we didn't find a clear effect of using fans or not on fluxes estimation. As we show in the next figure (Fig.1R), for more than 30 measurements, there is no clear effect of using fans against not using them on soil CO_2, CH_4 and N_2O fluxes. These results are in line with the results published by Maier et al. (2022) in a guideline for soil gas measurements with non-steady-state chambers.

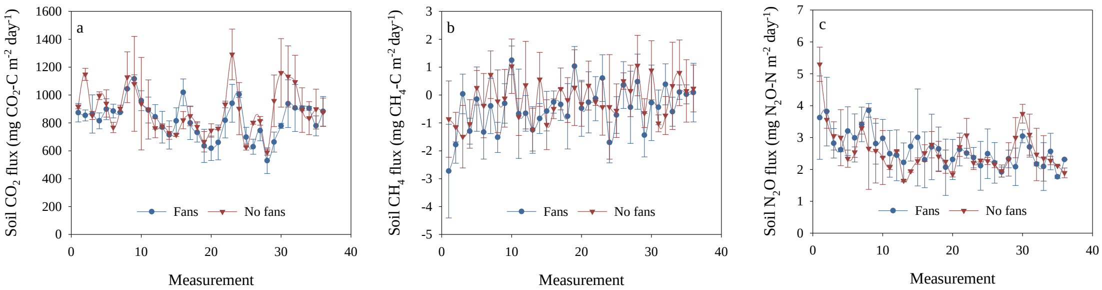

Fig. 1R. Effects of using or not using fans on soil a) CO_2, b) CH_4 and c) N_2O fluxes. Blue line represents fluxes measurement with chamber fans activated. Red line represents fluxes measurement with chamber fans deactivated.

Moreover, we modified the discussion section to include the MDF as an explanation of the differences in emissions observed between chamber systems. (L299-309)

"In line with the previous explanation, the Minimum Detectable Flux (MDF) following the equation presented by Nickersen (2016) was calculated for methodologies. The MDF method not only considered the accuracy of the analyser but also considered the area and volume of the chamber and the enclosure time, factors that are different between both methodologies compared in this work. The MDFs for the automated chamber system were 1.209 mg CO_2-C m^{-2} day^{-1}, 0.012 mg CH_4-C m^{-2} day^{-1} and 0.059 mg N_2O-N m^{-2} day^{-1}, while for the manual chamber system, MDFs values were 14.050 mg CO_2-C m^{-2} day^{-1}, 0.143 mg CH_4-C m^{-2} day^{-1} and 0.071 mg N_2O-N m^{-2} day^{-1}. MDF was greater for the automated chamber system for the three gases, considering a similar enclosure time of 20 minutes and an average air temperature during the experiment of 20° C. The differences in MDF found between both methodologies was another factor that explained the greatest fluxes values observed under the automated chamber system. "

Nickerson, N. (2016). Evaluating gas emission measurements using Minimum Detectable Flux (MDF). Eosense Inc., Dartmouth, Nova Scotia, Canada.

Maier, M., Weber, T. K., Fiedler, J., Fuß, R., Glatzel, S., Huth, V., Sabine Jordan, S.;Jurasinski, G.; Kutzbach, L.; Schäfer, K.; Weymann, D. & Hagemann, U. (2022). Introduction of a guideline for measurements of greenhouse gas fluxes from soils using non-steady-state chambers. Journal of Plant Nutrition and Soil Science, 185(4), 447-461.

Specific comments

C5: Lines 29f.: I disagree with this sentence. It is possible to resolve short-term emission events with manual chambers. The common low sampling frequency is simply a result of the high labor-intensity of this method. You explain this point very well in the introduction.

Answer C5: We agree with Reviewer's comment and we modified the abstract to clarify it. (L29-32)

"However, manual chambers are characterised by low sampling frequency, typically one sample per day is considered a high sampling frequency. Therefore, a great deal of effort is required to monitor short-term emission events such as fertilisation or rewetting"

C6: Lines 39ff.: Maybe include some numbers in the abstract, e.g. how much higher were the measured fluxes.

Answer C6: We modified the abstract as the Reviewer suggested. (L40-41)

"The automated system reported soil GHG fluxes up to 58 and 40% greater for CO_2 and N_2O fluxes compared to the manual chamber system"

C7: Line 47: Use the latest IPCC assessment report from 2023. There the entire AFOLU sector is listed with 22 % contribution.

Answer C7:We modified the text following the Reviewer's suggestion. (L48-49)

C8: Lines 83 – 86: I would include two more aspects here: 1) As a result of the constraints lower spatial coverage compared to manual chambers, and 2) also more and more companies start selling automated chambers systems; it is becoming a market

Answer C8: We have included both aspects suggested by the Reviewer. (L85-91).

"However, this method requires costly equipment and skilled operators and implies different infrastructure constraints, factors that result in lower spatial coverage compared to what can be achieved with manual systems. Moreover, these automated chamber systems are beginning to be manufactured and distributed by companies dedicated to the manufacture of gas analysers, with the limitation of being close systems to be modified. Based on that situation, over recent decades, several groups have crafted automated systems (Lognoul et al., 2017, Lawrence and Hall, 2020)."

C9: Lines 176ff.: Despite the reference, it would be good to include information if a collar was used with the manual chambers and the insertion depth.

Answer C9: We have included in the text detailed information about manual chamber collars as the Reviewer suggested. (L195-196)

"Each chamber was placed same diameter PVC collar inserted 0.05 m into the soil"

C10: Lines 190ff.: Include the source for the climate data.

Answer C10: We have added the climate data source to the text following the Reviewer's comment. (L210-211)

"The meteorological data were obtained from a meteorological station situated at 0.5 km from the experimental site."

C11: Lines 209ff.: There are some words mixed up/writing mistakes which make this paragraph a bit hard to read.

Answer C11: We rewrite the text to clarify it. (L228-233).

"The second step of the evaluation experiment consisted of assessing the impact of the sampling time (i.e. hour of the day) and sampling frequency (i.e. 16 daily measurements vs 1 daily measurement for the automated and the manual chamber system, respectively) on the estimation of the soil gas fluxes. For that propose, from 22 of May 2023 to 29 of June 2023, soil CO_2, CH_4 and N_2O fluxes were measured simultaneously by the manual and automated chamber systems in the same field experiment "

C12: Line 345: Was there a specific reason for sampling at 6:00 GMT?

Answer C12: 6:00 GMT corresponds to 08:00 am in Spain, during summer time. There are two main reasons to perform soil gas sampling at 08:00. The First reason is related to the schedule of other important agricultural practices such as irrigation. In terms of reducing the impact of irrigation on maize photosynthesis, irrigation is applied in the early morning hours (when nighttime irrigation is not possible), starting at 08:00 am and lasting up to 6 hours when water requirements reach maximum values. The second reason is due to in summer months, at midday, air temperature can reach values higher than 35-40 ºC. These high temperatures are not comfortable to work in the field, and as a general recommendation, fieldwork at that hour should be avoided if possible. Therefore, in other to maintain homogeneity in the sampling hour, this is set according to the most restrictive period, in this case, the summer period.

C13: Lines 346f.: Wu et al. (2021) state 10:00 am. Do you consider 6:00 really close to that?

Answer C13: As we explained in the comment before, 6:00 GMT correspond to 08:00 am during summer time in Spain. From our point of view, a two-hour difference, it's no such a time difference and for that reason, we consider that our sampling time is close to the sampling time of Wu et al. (2021). Moreover, we specify in the text that 6 GMT correspond to 8 am. (L395)

C14: Lines 357f.: You don't say anything about the costs in your manuscript. Compared to what is your system more affordable?

Answer C14: We had some information about the cost of the system following the Reviewer's recommendation. (L142-143).

"The cost of each chamber, including the solenoid valve and the sampling line is 600 €."

C15: Section 2.5: I presume you used a linear fit in equation 1? The molar weights in the brackets are not correctly displayed. You have to write C-CO2, C-CH4, and N-N2O. The R version used is the same as mentioned previously in the manuscript? Did you use any special R packages for the flux calculation or just the base packages?

Answer C15: Yes, we used a linear fit to calculate the fluxes and we didn't use any specific packages for that purpose, just the base packages. R version is the same for fluxes calculations and for running the script that controls the system.

We have corrected the error related to molar weight and rewrote the text to clarify this section according to the Reviewer's comment. (L253-262).

"where Fit represents the linear increase of gas concentration in the chamber over the enclosure time, MW is the molar weight of the atom in the gas molecule (i.e. 12 g mol¬-1 for CO2-C and CH4-C and 28 g mol¬-1 for N2O-N), p is the atmospheric pressure in Pa, h is the chamber height in m, R is the ideal gas constant in J K¬-1 mol¬-1, T is the chamber air temperature in K, fT is the correction factor of time units, 1440 minutes day¬-1 and fU is the unit correction factor, 10¬3. Cumulative soil CO2, CH4 and N2O emissions were calculated using the trapezoid rule (Levy et al., 2017). Comparison between systems was done by linear fitting considering only soil gas fluxes that presented a R2 higher than 0.8. Moreover, comparison in cumulative emissions between chamber system over one month was evaluated by one-way ANOVA. All analyses were done using the R statistical software version 4.2.2 (R Core Team, 2022)."

C16: Figure 3: In this figure it looks like the system is not a closed-loop system but the air drawn from the chambers is simply discarded to the atmosphere. Could this be one contributing factor to the higher fluxes measured with the automated chambers, e.g. pressure fluctuations despite the installed chamber vent? How long were the sampling lines and how long were your purge times?

Answer C16: As the Reviewer properly appreciate, the system is an open-loop that after the sample passthrough the analyser it's discarded. We did not test the chamber system in a close-loop, so we cannot guarantee that this could be a possible reason for the higher fluxes observed for the automated chamber system.

However, Hutchinson and Livingston (2001) stabilized that including a vent is the solution to avoid pressure or volume changes in non-steady state chambers. The inclusion of a vent reduces the disturbance associated with the pressure or volume changes that are responsible for changes in the soil diffusion process between soil and the internal chamber atmosphere, which may result in significant changes in the mass flow that governs the soil fluxes.

Sampling lines are 50 m long, yielding 630 mL. The purge time of each sampling is 90 seconds. The sampling line only needs 15 seconds to be purged, however, our purge time or specifically the time that each line is active corresponds to the analyser frequency, one analysis each 90 seconds. As we showed in Figure S1, each valve was open 30 seconds before the analyser was ready, giving the system enough time to purge the line and thus avoid contamination with the dead volume of the sampling line.

Hutchinson, G. L., & Livingston, G. P. (2001). Vents and seals in non-steady-state chambers used for measuring gas exchange between soil and the atmosphere. European Journal of Soil Science, 52(4), 675-682.

C17: Line 370: I don't see how you can easily modify the number of chambers (also compared to other automated system). It is not only about the chamber number itself. What about power consumption, adjustment of the sampling protocol, length of tubing in the field, quick movability in case of field operations?

Answer C17: Modify the number of chambers it's just a matter of activating more o fewer channels in the relay board and also modifying the number of chambers per block in the R script. Compared to other systems like Gasera Multipoint Sampler (Gasera Ltd, Finland), which has a close configuration of 8 or 12 channels, our system allows to work with a higher number of chambers just replacing the 16 channels relay board for another relay board with extra channels. In terms of power consumption, including more chambers has a low impact, since solenoid valves have a small consumption only when activated. As shown in Figure S1, including an extra chamber per block will modify the total analysis time, but this system also allows to work of chambers independently not needing to be grouped in blocks if the total analysis time of one block exceeds the desired times.

Regarding the length of tubbing, this is independent of the number of chambers, since each chamber has its sampling line. In terms of movability during field operation, this probably is the main weakness of the system, it's clear that for every field operation that requires machinery, the system must be dismantled previously. However, this system can be fully dismantled in less than one day by two persons.

Finally, we modify the Material and Method section to explain better how the number of chambers can be modified in our system and compare it to other systems for controlling automated chamber systems. (L170-179).

"This R script, governed by the time taken by the analyser to process the sample, can be easily modified by setting the total number of chambers or, if it is necessary to work by blocks, by setting the number of blocks and the number of chambers per block. One of the advantages of this system is the self-made multiplexer that allows to modify the number of chambers easily compared to other multiplexers like Gasera Multipoint Sampler (Gasera Ltd, Finland) which has a close configuration of 8 or 12 channels. Moreover, the use of relay boards that could be configured by Arduino or easily integrated into the R script as the selected ones, as an alternative to control modules, for example, I-7060D (ICP DAS CO, LTD) that only have four channels per module, simplifies the configuration of the script, since just with one board it's possible to handle all the chambers."

Time valve on (s)	Time valve off (s)	Chamber		Gasera (s)
0	0		Close block 1	0
10	28	1		0
28	111	2		83
111	194	3		166
194	277	4		249
277	360	1		332
360	443	2		415
443	526	3		498
526	609	4		581
609	692	1		664
692	775	2		747
775	858	3		830
858	941	4		913
941	1024	1		996
1024	1107	2		1079
1107	1190	3		1162
1190	1273	4		1245
1273	1356	1		1328
1356	1439	2		1411
1439	1522	3		1494
1522	1605	4		1577
1800	1800		Close block 2	1800
1810	1828	5		1800
1828	1911	6		1883
1911	1994	7		1966
1994	2077	8		2049
2077	2160	5		2132
2160	2243	6		2215
2243	2326	7		2298
2326	2409	8		2381
2409	2492	5		2464
2492	2575	6		2547
2575	2658	7		2630
2658	2741	8		2713
2741	2824	5		2796
2824	2907	6		2879
2907	2990	7		2962
2990	3073	8		3045
3073	3156	5		3128
3156	3239	6		3211
3239	3322	7		3294
3322	3405	8		3377
3600	3600		Close block 3	3600
3610	3628	9		3600
3628	3711	10		3683
3711	3794	11		3766
3794	3877	12		3849
3877	3960	9		3932
3960	4043	10		4015
4043	4126	11		4098
4126	4209	12		4181
4209	4292	9		4264
4292	4375	10		4347
4375	4458	11		4430
4458	4541	12		4513
4541	4624	9		4596
4624	4707	10		4679
4707	4790	11		4762
4790	4873	12		4845
4873	4956	9		4928
4956	5039	10		5011
5039	5122	11		5094
5122	5205	12		5177

Figure S1 Scheme of sampling sequence for 3 block with 4 chambers per block

C18: Figure 4: Is the sign for the p-value accidently flipped around or is it really >?

Answer C18: Thank you to the Reviewer for pointing out that error. We modified Figure 4 to correct the error.

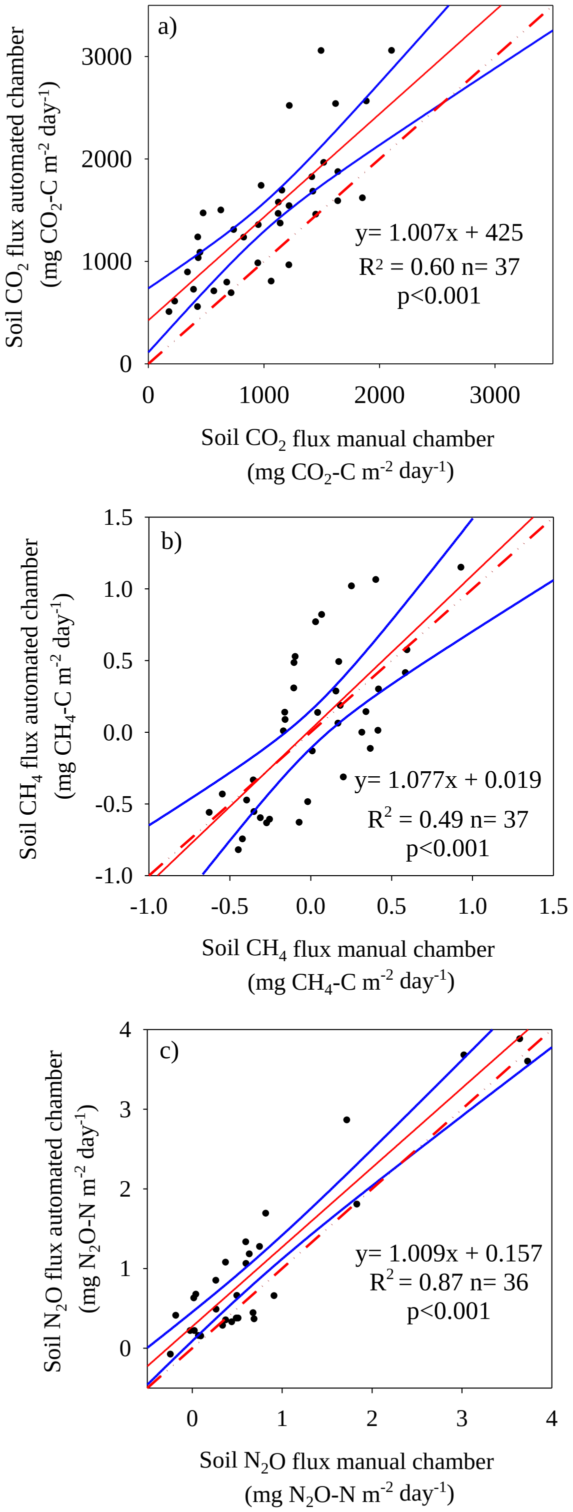

Figure 4 corrected

C19: Figure 5: What are the cumulative soil gas emissions in this figure (sorry, maybe I just don't get it for whatever reason; or are these average fluxes or do you mean scaling up from hourly to daily fluxes)? The color description in the caption is the wrong way around (also in Fig. 6). I am missing error bars. How certain are your flux estimates? I know error bars can make a plot unreadable, but at least include some information about the uncertainty range in the caption.

Answer C19: Data presented in Figure 5 are the soil gas fluxes obtained with both chamber systems from May 22nd to June 29th. Fluxes were upscaled from hourly to daily emissions. Moreover, the left panel represent the fluxes obtained over 24 hours with the automated chamber system on the days that the manual chamber sampling was performed.

We thank the Reviewer for pointed out the error related to the color description in the caption. We modified it in both figures. Besides, following the Reviewer suggestion, we had the standard error as a bar plot in Figure 5 to include information about the uncertainty of our measurement.

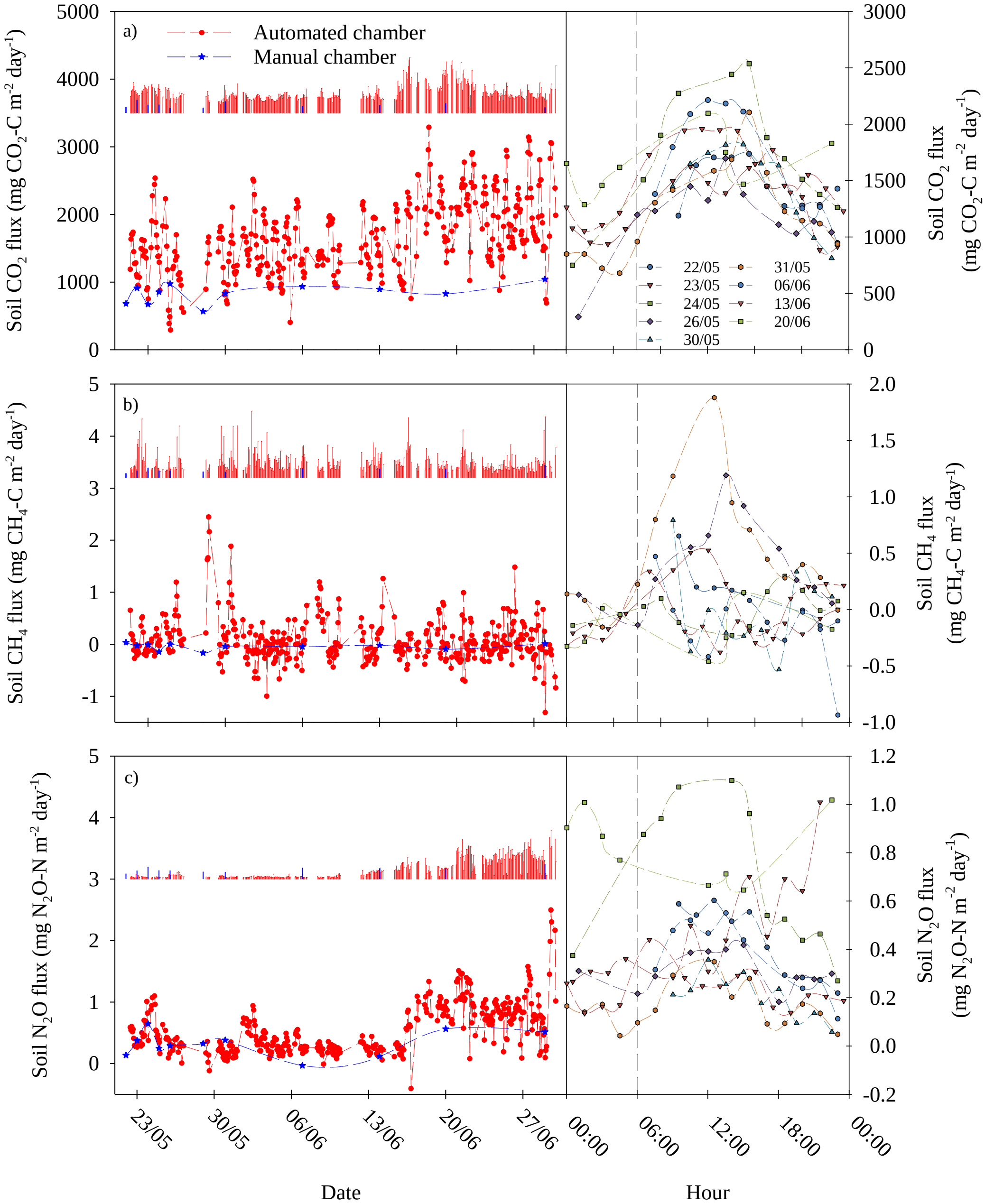

Figure 5 corrected

C20: Figure 6: Why is CO2 in Mg and the other gases in kg? There is one "soil" too many in the first sentence of the caption. What statistical test did you use?

Answer C20: CO_2 cumulative emissions are expressed in Mg rather than kg just to avoid having values of 600 kg CO_2-C ha^{-1} while CH_4 and N_2O emissions, values were below 1. kg ha^{-1}. Comparison between systems was done by one-way ANOVA. We also include this information in the Material and Method section. (L260-261)

"Moreover, comparison in cumulative emissions between chamber system over one month was evaluated by one-way"

Here the authors have compared measurements of soil gas fluxes using chambers and an automated chamber design based on the 'Queensland design''. Please see the uploaded pdf for grammatical/text suggestions. The manuscript is reasonably cler to read but would benefir from editing. The abstract contains repetition of ideas. As I began to read the manuscript I wondered what the new knowledge to be delivered to the reader would be. I'm not sure after finishing the text I have learnt anything new. Please emphasise what is novel with the study. Others have compared automated and manual chamber methods as noted in the text. Others have used automated results to help decide when to take manual chamber samples to reduce diel variation/bias in manual sampling (e.g. van der Weerden et al. 2013) - such an approach could be used here too. As a reader I want to know what method was more acccurate. Obviously we know automated methods provide greater frequency. How significant was the diel variation? What error might be incurred by taking manual samplease at any given time? What were the respective detection limits for the two methods? What other biases/benefits did the methods give? - e.g. automated chambers have clear walls allowing photosynthesis and plant function but chambers were opaque shutting down photosynthesis so implications for the CO_2 flux and actually what the flux represents. Overall I think some more detail around the methodologies is clearly needed and the discussion should be better developed to clearly state what is novel about the manuscript.

Grace et al. 2020 Global Research Alliance N_2O chamber methodology guidelines: Considerations for automated flux measurement. J Environmental Quality

van der Weerden, T. J., Clough, T. J., & Styles, T. M. (2013). Using near continuous measurements of N_2O emission from urine-affected soil to guide manual gas sampling regimes. New Zealand Journal of Agricultural 1140

We thank the Reviewer for his comments and suggestions. Changes in the text are highlighted in yellow

The abstract was rewritten to avoid repetition of ideas.

We agree with the Reviewer that automated chamber systems have been in use for more than two decades. However, still to date, the implementation of this system is scary due to different reasons as we explain in the introduction (L86-91).

One important aspect of this automated chamber system is that the multiplexer, which is controlled by a relay board based on Arduino are easily controlled by an R script. In that way, the system became an open-source system by replacing the relay board depending on the desired number of cameras allowed to operate with a different number of chambers. Since this novelty of the system was not clear in the previous version, we have modified the text to clarify it (L92-98; L170-179).

The objective of this study is to develop and test an automated chamber system. For that objective, we used as a “reference” method the manual chamber system due to our expertise working with it which resulted in several publications (L186-187). However, despite the objective of this work is not to give recommendations about sampling time or which system must be used, we highlighted that for our conditions, 06:00 GMT is an appropriate hour to carry out gas sampling with a manual chamber system to have a representative daily emission of N_2O, the main greenhouse gas from agricultural soil. (L395-399).

We agree with the Reviewer that there is a lack of information about the accuracy and detection limits of both methods. In the new version of the manuscript, we calculated the Minimum Detectable Flux (MDF) for both systems based on Nickersen (2016). (L299-309)

"In line with the previous explanation, the Minimum Detectable Flux (MDF) following the equation presented by Nickersen (2016) was calculated for methodologies. The MDF method not only considered the accuracy of the analyser but also considered the area and volume of the chamber and the enclosure time, factors that are different between both methodologies compared in this work. The MDFs for the automated chamber system were 1.209 mg CO_2-C m^{-2} day^{-1}, 0.012 mg CH_4-C m^{-2} day^{-1} and 0.059 mg N_2O-N m^{-2} day^{-1}, while for the manual chamber system, MDFs values were 14.050 mg CO_2-C m^{-2} day^{-1}, 0.143 mg CH_4-C m^{-2} day^{-1} and 0.071 mg N_2O-N m^{-2} day^{-1}. MDF was greater for the automated chamber system for the three gases, considering a similar enclosure time of 20 minutes and an average air temperature during the experiment of 20^o C. The differences in MDF found between both methodologies was another factor that explained the greatest fluxes values observed under the automated chamber system."

- Nickerson, N. (2016). Evaluating gas emission measurements using Minimum Detectable Flux (MDF). Eosense Inc., Dartmouth, Nova Scotia, Canada.

We also agree with the Reviewer that the explanation about the sampling time effect was too vague. In this new version of the manuscript, we added more information about the effect of sampling hour on the estimation of soil gas fluxes (L353-368).

"Based on the daily emissions pattern observed, right panels of Figure 5, the time of sampling can have a very high impact on the gases flux estimation for manual chambers systems, especially when only one sampling is done per day. For CO_2 emissions, carried out the manual sampling at 06:00 GMT suppose and underestimation of 43% respect to the mean daily flux estimated over 24 hours with automated chamber system. Average soil CO_2 fluxes determined with the manual chamber system over the nine dates was 836 mg CO_2-C m^{-2} day^{-1}, while the 24 hours CO_2 flux for the same nine date measuring with the automated chambers system was 1469 mg CO_2-C m^{-2} day^{-1}. In contrast, sampling hour had a minimum impact on soil CH_4 fluxes, obtaining the similar average flux in both systems, 0.066 and 0.068 836 mg CH_4-C m^{-2} day^{-1} for the manual and the automated chamber system, respectively.

Regarding N_2O emissions, 06:00 GMT resulted in an adequate sampling hour to obtain a representative daily emission. Average soil N_2O flux of the nine manual sampling was 0.38 mg N_2O-N m^{-2} day^{-1}, while the daily average for the same nine dates estimated with the automated chamber system was 0.41 mg N_2O-N m^{-2} day^{-1}, resulting the fluxes determined with the manual chambers in an underestimation of 7% compared to the N_2O fluxes determined with the automated chambers."

From our point of view, the main benefit of the automated chamber system is the greatest measurement frequency that provide, resulting in better estimation of the cumulative emissions and allowing to capture with higher precision important events for soil gas emissions such as fertilization o rewetting events.

Other aspects like having clear walls, from our perspective, are aspects that are not linked to the operation of the chambers, i.e., whether sampling is manual or by an autonomous system. Having translucent wall to allow photosynthesis it is also possible with manual chamber and the election of the kind of wall will depend on the objective of work.

Finally, as the reviewer suggested, we will carefully review your comments in the text and improve the content of the document itself.