Anonymous Referee 1:

As an important component of the ecohydrological cycle, it is always difficult to analyze and quantitatively characterize Non-rainfall water (NRW). In this paper, the author designed, manufactured and tested a novel micro-lysimeter (ML) system, which has high precision and weighing range, and overcomes some defects of the existing lysimeters. Different types of NRW inputs, such as dew, hoar frost, fog, rime and the combinations among these, are well distinguished by auxiliary sensors. At the same time, it is also similar to the surrounding environment in terms of canopy and soil temperature, plant growth and soil humidity. The author applied the ML system at a field site in Switzerland. Through the monitoring of a hydrological year, different NRW events were effectively distinguished and the NRW inputs was quantified. In general, the paper has good innovation and practical value, but some parts need to be improved, and major revision are suggested. The specific opinions are as follows.

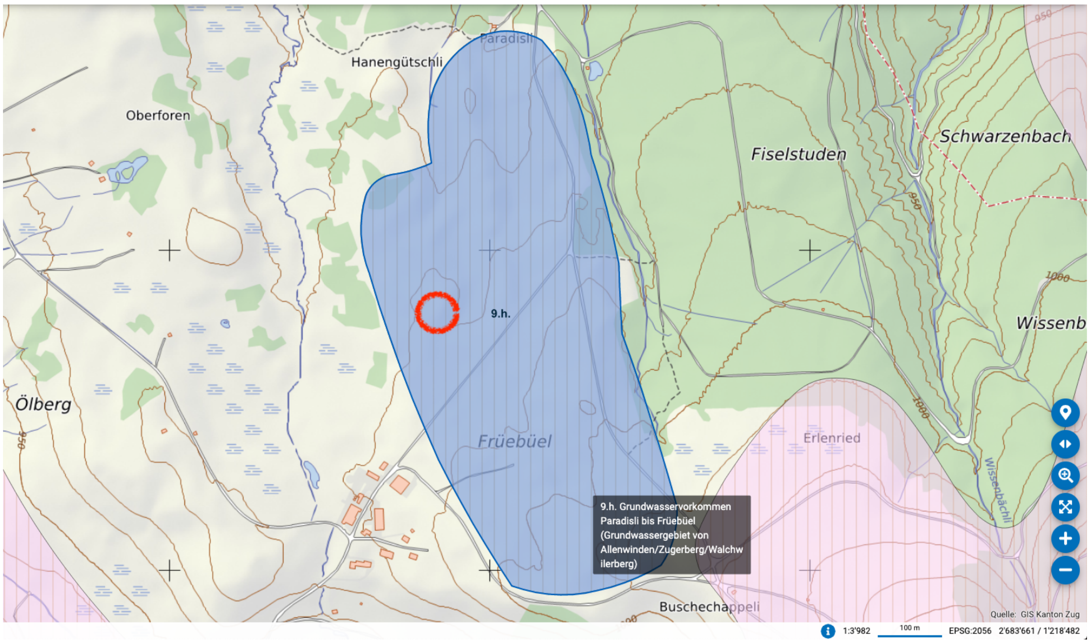
1. It is recommended to attach the location map of the study site in Switzerland and the real photos of the ML system;
2. How deep is the groundwater level? Should the impacts of groundwater be considered?
3. Line 215-220, it may be difficult to transfer the soil body from one ML to the second. How to ensure the stability of soil during transfer?
4. Do you think freezing-thawing would have impacts? Should the accuracy of the ML change at different temperatures?
5. Can the ML distinguish the influences from dust or other drifting materials falling on it?
6. According to the author's statement, the ML can only distinguish windless conditions, so it cannot work on windy days? NRW input over a year in Figure 8 might be underestimated?
7. The ML can quickly discharge the excess water after precipitation, but this would also cut off the evapotranspiration channel, which might misrepresent the conditions in the nearby soils. Will it affect NRW?
8. In figure 7 (b), it is described as WFPS in the text, but not in this figure.
9. Different types of NRW inputs in Figure 8 can be represented in different colors. The same is for Figure 9.

Response to Referee's comments:

We thank the anonymous reviewer for his/her constructive feedback and inspiring questions. We will do our best to improve our manuscript accordingly. Our response to reviewer's suggestions and critique is given in blue indented text point by point.

1. We will add a location map and real photographs of the ML system to the Appendix.

2. The Früebüel site (CH-FRU) is in a local groundwater zone (see GIS map below), but without groundwater level depth information. The reason for this is that the CH-FRU site is located on a hill (red circle in map below) on a glacial moraine with undulating bedrock below, hence the depth to groundwater should be deepest where our long-term site is placed. All our sites (not only the one shown here) are either in mountain terrain without large-scale alluvial deposits where a homogeneous aquifer could develop, and in the one case where our file site (CH-CHA, not included in this analysis) is in a valley with a well-defined aquifer, the water table of this aquifer is ca. 10 m below surface. So the topographic setting at CH-FRU does not allow for stagnant water leading to high water tables, but it can lead to wet soils when intensive precipitation is observed over longer periods, which however can drain in all directions. The disconnection of the ML pot to the underlying soil and in consequence to the groundwater body is however a general lysimeter problem. We will add a statement to the manuscript.



Extent of the groundwater zone around the Früebüel site (CH-FRU), taken from the cantonal GIS (dimension of screenshot is 1700 m × 960 m, taken from maps.zg.ch – only available in the official language which is German). The isolines around the site (red circle) show the drainage to be in all directions.

3. Indeed! This is quite a challenge. From our experience the monolith breaks most likely at the bottom, whereas breaking at the edges is not a big issue. At the time of installation, we were three people at the site and could manage to retrieve three undisturbed soil monoliths after one failure. We found that this work is best done when the soil is not completely dry or extremely wet to avoid any breaking of the monolith. We will add more details about this process, furthermore we will add some photographs to describe the process better.
4. Freezing-thawing could damage PVC parts of the ML, however this did not occur during the study period. We will add that it could potentially occur.
   The used load cells are temperature compensated. Four strain gauges in a Wheatstone bridge configuration are part of each load cell. The changes in resistance of the strain gauges that would occur solely due to temperature changes are thus balanced, because

all four strain gauges (two positive, two negative) behave in the same way with temperature change and thus effectively cancel the temperature change signal. The remaining, minute residual error is corrected by special Nickel elements that are connected to the Wheatstone bridge. We will add to the methods section that the load cell was temperature compensated.

5. Thank you for pointing this out. Materials falling on the ML pots would lead to a sudden mass increase, which can be identified in the data. However, slow deposition of dust/sand particles could be misinterpreted as NRW inputs. We don't think that this is a big issue at the CH-FRU site (high vegetation cover), but it could be a big issue in deserts and arid regions, where the soil vegetation cover is low. We will add that depositing materials that accumulate on the ML over time like sand could be an issue.
6. The ML system was designed to measure NRW inputs, which occur during nights with low wind speeds. The probability for dew formation decreases below 5% when wind speeds are smaller than 0.4 m s^{-1} or bigger than 1.9 m s^{-1} (Zhang et al., 2014). Thus, wind might not be a big bias source for NRW quantification, because wind speeds are low during NRW inputs. Higher wind speeds could exert a force on the ML pot and increase thereby the mass, which would lead to an overestimation, not to an underestimation of mass. High nightly wind speeds are the main driver of night time evapotranspiration (antagonist of NRW inputs) instead of dew formation (Groh et al., 2019; Padrón et al., 2020). We will add this information for clarification.
7. The water source of NRW inputs is atmospheric water vapor. The atmospheric water vapor can also stem from evaporated soil water, termed distillation. Distillation can contribute up to 42 % of the condensed water on foliage during dew nights (Li et al., 2020). Thus, a ML pot that is cut off from the evapotranspiration channel might contribute less to the distillation process. However, in the boundary layer atmospheric water vapor is distributed via turbulence and thus the ML is subject to the same atmospheric water vapor as the surrounding field. This cut-off might still lead to the same amount of condensation (e.g. dew formation on plants). However, prolonged altering of soil moisture could have an influence on plant growth and in consequence to NRW inputs (please have also a look at our response to a similar comment by reviewer 2).
8. Thanks for pointing this out. We used once "WFPS" instead of "Soil temperature" which created some confusion. We will correct it.
9. We will change it according to your suggestions.

Groh, J., Pütz, T., Gerke, H. H., Vanderborght, J. and Vereecken, H.: Quantification and Prediction of Nighttime Evapotranspiration for Two Distinct Grassland Ecosystems, Water Resour. Res., 55(4), 2961–2975, doi:10.1029/2018WR024072, 2019.

Li, Y., Aemisegger, F., Riedl, A., Buchmann, N. and Eugster, W.: The role of dew and radiation fog inputs in the local water cycling of a temperate grassland in Central Europe, Hydrol. Earth Syst. Sci. Discuss., 1–27, doi:10.5194/hess-2020-493, 2020.

Padrón, R. S., Gudmundsson, L., Michel, D. and Seneviratne, S. I.: Terrestrial water loss at night: global relevance from observations and climate models, Hydrol. Earth Syst. Sci., 24(2), 793–807, doi:10.5194/hess-24-793-2020, 2020.