

## Response to referee's comments

*We thank referee and greatly appreciate the thoughtful and constructive comments and helpful suggestions. We have fully considered the referee's comments in the revision and improved the manuscript accordingly. Answers to referee's questions are italicized and in blue color.*

### General comments:

In this manuscript, by introducing a threshold value of soil water content (SWC), the dominating factor of diel variation of soil respiration is identified as photosynthesis or temperature, corresponding to autotrophic or heterotrophic respiration. Generally, the MS is well written and the topic is interesting, however, it would be better to substitute the ratio of SWC to soil porosity for SWC. As the author mentioned in “4.1 Physicalvs. biological-processes in the control of diel hysteresis”, within-soil gas transport is influenced not only by SWC, but also by soil porosity. So with the ratio of SWC to soil porosity, the results and conclusion of this MS will be more comparable and universal, but not so local.

*Answer: We agree with the above-described comments. Following the referee suggestion, we added the text '(ratio of SWC to soil porosity 0.26)' behind the threshold ( $0.08 \text{ m}^3 \text{ m}^{-3}$ ) in Introduction (line 7 on P1), Results (line 19 on P6), Discussion (line 19 on P7) and Conclusions (line 18 on P8) paragraphs in the manuscript. However, we still wanted to show also the SWC threshold there. (see attached supplement file)*