

## ***Interactive comment on “Spatially resolved soil solution chemistry in a central European atmospherically polluted high-elevation catchment” by Daniel A. Petrash et al.***

**Daniel Petrash**

daniel.petras@geology.cz

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Soil is an intrinsic part of the Critical Zone (CZ), i.e., the thin, living skin of the earth, from the top of canopies down to saturated bedrock (Field et al., 2015). The bedrock in our mountain catchment exhibits no variation in lithology. Therefore, by combining soil solution chemical measurements and establishing meaningful comparisons with published hydrochemical data, we provide evidence pointing to carbon availability and landscape as major controls over the flux of water and solutes through the CZ in our small, N-saturated catchment (e.g., Chorover et al., 2011; Brantley et al., 2017). With our measurements and hydrochemical comparisons we aimed at evaluating spatial and

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temporal alterations on the water chemistry among hydrological compartments of the CZ and calculated transit times within the soil. And because of landscape simplicity, which facilitates discerning flow paths, it is possible discussing potential variations in weathering products linked to N-saturation using our dataset.

Reviewer 1 kindly pointed out that the introduction in our original submission is deficient in highlighting the purpose of our study as briefly stated above. This flaw, which was also kindly noticed by Prof. Dr. Henning Meeseburg, is being carefully addressed in the revision of our MS.

In our view, understanding the coupling of soil development processes and hydrology over variable time scales, and between deep and shallow weathering processes remains as one of the major challenges of soil systems science. For this reason, we respectfully disagree with Reviewer 1 on the statement that the topic of our study does not concern to SOIL, but rather to a journal exclusively dealing with hydrology. We are addressing each of the reviewer's concerns and clarifying key aspects of our work aiming at publication in SOIL.

We thank the anonymous Reviewer 1 and Prof. Dr. Henning Meeseburg for their contributions to this SOIL Discussion.

References Brantley et al., 2017. *Geomorphology*, 277, 100–117. Chorover, J., et al., 2011. *Vadose Zone J.* 10, 884–899. Field, J. P., et al. 2015. *Vadose Zone J.*, 14(1), 1–7.

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