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Opponent's review of the Doctoral Thesis

Candidate Ing. Jakub Jerábek

Title of the doctoral thesis Studying of dominant factors influencing a shallow runoff formation at a small catchment scale

Study Programme Civil Engineering

Tutor Ing. David Zumr, Ph.D.

Opponent PD DI Dr. Reinhard Nolz

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Topicality of the doctoral thesis theme

Commentary: In his work, Jakub Jerábek deals with various aspects of soil-water-interrelations on a small scale in connection with soil cultivation and rainfall or irrigation. This is of interest for agricultural water management and hydrological investigations, and is becoming increasingly important in the context of current challenges such as climate change adaptions. Hence, the candidate contributes to highly topical scientific issues.

☒ excellent	☐ above average	☐ average	☐ below average	☐ poor

Fulfilment of the doctoral thesis objectives

Commentary: The objectives are well defined and fulfilled. However, focusing on one main objective (with sub-objectives) might have helped to better connect all parts and merge the results and conclusions at the end.

☐ excellent	☒ above average	☐ average	☐ below average	☐ poor

Research methods and procedures

Commentary: Several different approaches, methods and devices were used. Soil water sensors, for example, were installed for the field experiments. The measurements were extended by well-established models as well newly developed algorithms. All methods are described in detail and are appropriate to adress the research objectives. The author presents broad knowledge on basic soil water processes and characteristics.

☒ excellent	☐ above average	☐ average	☐ below average	☐ poor

Results of the doctoral thesis – dissertant's concrete achievements

Commentary: The key results include the investigation and description of water transport processes (runoff and inflitration) and storage processes in dependence of different soil structures (microtopography). This leads to a better understanding of soil-water-relations, expressed and summarized by a redefined conceptual model.

☒ excellent	☐ above average	☐ average	☐ below average	☐ poor

Importance for practice and for development within a branch of science				
Commentary: The key findings contribute to a better understanding of runoff and surface storage processes and related processes on a small scale. The redefined conceptual model could be used, for instance, to improve models or evaluate agricultural management practices. The detailed description of the methodology and the interpretation of measurements provide a basis for (improved) measurements campaigns in the future.				
☒ excellent	☐ above average	☐ average	☐ below average	☐ poor

Formal layout of the doctoral thesis and the level of language used				
Commentary: The thesis appears well structured and a general frame is given. However, not all parts (chapters) are obviously related or clearly lead to the overall objectives. Hence, it was not easy to follow some of the argumentations in the context of the (main) objectives. Chapters 1 to 4 present basics (similar to a textbook). From my point of view, readability could have been improved by presenting the relevant principles in relation to the description of the methodology. On page 29, a "literature review" is mentioned. Maybe also chapters 1 to 4 are meant as literature review, but then the mentioned findings are not consistent with "governing equations", for instance. Some figure captions lack of descriptions of the abbreviations used. The axis labeling is partly very small. The language is clearly understandable.				
☐ excellent	☐ above average	☒ average	☐ below average	☐ poor

Statement on compliance with citation ethics
Sources were cited correctly.

Remarks
A key part of the thesis (Jerabek et al. 2022) was in the meantime published in the Journal of Hydrology. Congratulations. The author has also contributed to publications in other highly ranked journals as co-author.

Final assessment of the doctoral thesis
Overall a very good, partly excellent work.

Following a successful defence of the doctoral thesis I recommend the granting of the Ph.D. degree		
	yes ☒	***no*** ☐

Date: 2022-09-30

Opponent's signature: .....