

Opponent's review of the Doctoral Thesis

Candidate Jaroslav Pastorek

Title of the doctoral thesis Experimental evaluation of precipitation estimates from commercial microwave links for rainfall-runoff modelling in a small urban catchment

Study Programme Civil Engineering

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Topicality of the doctoral thesis theme

Commentary: The doctoral thesis deals with a scientifically and technologically challenging (opportunistic sensing of rainfall using commercial microwave links (CMLs)) and at the same time societally relevant (urban hydrology and water management) subject.

excellent above average average below average poor

Fulfilment of the doctoral thesis objectives

Commentary: The doctoral thesis provides convincing evidence for the fact that the candidate has developed into an independent researcher during the course of his PhD research project. Notably, the thesis is based, among others, on two research articles which have been published in international peer-reviewed scientific journals, as well as several conference contributions.

excellent above average average below average poor

Research methods and procedures

Commentary: The candidate has applied original research methods to tackle the challenges identified in the introductory chapter, combining both physically-based (e.g. rainfall retrieval using CMLs) and statistical (e.g. uncertainty analysis of discharge simulations) approaches. Nevertheless, I would have appreciated: (1) a more detailed presentation of time series of transmitted/received CML signal levels and corresponding retrieved rainfall rates, in order to get a feel for the errors and uncertainties involved in quantitative precipitation estimation; (2) a more critical reflection on the employed spatially distributed (hydraulic) rainfall-runoff model. Is such a high-dimensional model fit for purpose or could a more parsimonious model have done an equally good job?

excellent above average average below average poor

Results of the doctoral thesis – dissertant's concrete achievements

Commentary: The candidate has convincingly demonstrated the potential of rainfall retrieval using commercial microwave links, both gauge-adjusted and stand-alone (after applying wet antenna attenuation correction), for urban hydrological applications.

<input checked="" type="checkbox"/> excellent	<input type="checkbox"/> above average	<input type="checkbox"/> average	<input type="checkbox"/> below average	<input type="checkbox"/> poor
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Importance for practice and for development within a branch of science

Commentary: The findings of this thesis are certainly of great practical value for urban water management. One aspect that has received relatively little attention is the issue of real-time data availability, which could become a limiting factor when applying the proposed methods to other (urban) areas.

<input type="checkbox"/> excellent	<input checked="" type="checkbox"/> above average	<input type="checkbox"/> average	<input type="checkbox"/> below average	<input type="checkbox"/> poor
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Formal layout of the doctoral thesis and the level of language used

Commentary: This is a very well-organized thesis, written in near perfect English.

<input checked="" type="checkbox"/> excellent	<input type="checkbox"/> above average	<input type="checkbox"/> average	<input type="checkbox"/> below average	<input type="checkbox"/> poor
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Statement on compliance with citation ethics

The thesis cites all relevant scientific literature.

Remarks

I appreciated reading this thesis very much and look forward to interacting with the candidate on the occasion of his doctoral defense.

Final assessment of the doctoral thesis

Overall, this is a very good doctoral thesis, which is of an internationally competitive level.

Following a successful defence of the doctoral thesis I recommend the granting of the Ph.D. degree

yes <input checked="" type="checkbox"/>	no <input type="checkbox"/>
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Date: June 13th, 2022

Opponent's signature: