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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Laboratory modelling of urban flooding: strengths and challenges of distorted scale models" *by* Xuefang Li et al.

Anonymous Referee #2

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GENERAL COMMENTS The manuscript presents an interesting study about the influence of horizontal/ vertical distortions of lab hydraulic models – to the best of my knowledge this is a novel investigation in the topic. The study is based on two existing datasets that were generated with other objectives in mind and, for this reason, the results are (somewhat) not fully conclusive, as the authors mention at the later sections of the manuscript. Nevertheless, in my opinion, the results are relevant to improve urban drainage lab modelling, and perhaps more important, the study identifies the need of new lab experiments to improve the understanding of urban drainage systems hydraulics. The manuscript is well written and clear. My main concern is the lack of consideration of uncertainties in the hydraulic measurements and their influence in the conclusions of the study. Below I suggest a few points that the authors may consider

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Discussion paper

to improve the quality of the manuscript

SPECIFIC COMMENTS Abstract: the meaning of “artefacts” should be presented, otherwise it is too vague. P1,L34: the authors refer to aerial images as a source for reference data. Although this is in theory valid, in many urban flooding situations the events are of short duration making capture of aerial data (e.g. from satellite and un- or manned aircraft sensors) challenging. P2,L6: the authors may also want to refer other recent lab experiments that were conducted at real scale (e.g. Moy de Vitry et al., 2017 – ESSD). These, of course, do have other challenges than those investigated in the present manuscript, but should also be discussed in the context of urban drainage hydraulic lab experiments. P2,L11: the authors refer to “both scales” at this point of the manuscript without yet having defined it. I assume the authors are referring to horizontal and vertical scales. Please clarify. P3,L35: “Using a distorted model. . .”. It seems that the sentence should start with something like “By using a distorted. . .”. P5,L19: “. . . at least four to six. . .”. I believe the authors can be more specific here. The mentioned experiment was conducted in 2017, so it should not be difficult to know exactly how many runs were carried out! P5,L22: “In contrast, . . .”. I cannot understand to what (sentence or idea) this sentence is contrasting to. Please consider rephrasing it. P7,L16: “. . . may be. . .”the use of this words does not sound very scientific. Please consider a different construction, e.g. “is between” P8,L12-17: this seems to belong to the methodology section. It is definitely not a result. Please consider moving these sentences to another section. P8,L26: “. . . almost. . .”. This is not a very scientific word. How many? What %? P8,L29: “. . . most. . .”. This is not a very scientific word. How many? What %? Figure 6a: does the figure report V (V=SUM Q) or Q? this should be made clear. Also, if it is Q, the variation can be included (error bars?). P9,L9: “Aspect ratio”. Should this be defined? Is it similar to hydraulic radius? Please explicitly define the meaning of “aspect ratio”.

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