

Interactive comment on “Estimation of deep infiltration in unsaturated limestone environments using cave LiDAR and drip count data” by K. Mahmud et al.

Anonymous Referee #2

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In the submitted manuscript, Mahmud et al present a study that analyses and classifies the stalactites and drip rate behaviour of a karstic cave in South West Western Australia. They use a LIDAR and shape-based classification scheme from a previous study (Mahmud et al., 2015) to map the ceiling of two cave chambers. Using 34 measurement locations they record the drip rate behaviour of a large subset of the LIDAR mapped stalactites. That way they show that distinct flow behaviour can be attributed to the shape classified stalactites. Using this knowledge, the total drip inflow of the two cave chambers is assessed by attributing mean “typical” drip rates of each flow type to all stalactites of the same shape type within the two cave chambers. Knowing

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precipitation and actual evapotranspiration the authors show that the water infiltrating to the two cave chamber is concentrated in the vadose zone to some extent.

The results shown in this study are new and innovative. Therefore, this contribution can be considered valuable for the HESS audience. However, a major part of the analysis is based on a previous study (Mahmud et al, 2015), which is explained and summarized repeatedly, sometimes in a slightly confusing way. I definitely recommend summarizing this study using a preliminary conceptual model description/sketch either in the data or study site description section, and deleting all other summaries of this previous study. That way the manuscript length will shorten significantly, which will make it easier to read.

Another point of criticism is the untypical structure of the manuscript. After introducing data and study sites the authors present some kind of pre-analysis and its discussion, before showing another (primary) analysis with another discussion. In all of them, references to other studies are too scarce and this particular structure may also confuse the reader. If there is no particular reason for this untypical order, please consider using the typical Introduction-Study Site- Methods –Results-Discussion-Conclusion structure.

Some more elaborations and minor comments can be found in the attached and commented pdf.

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/12/C4162/2015/hessd-12-C4162-2015-supplement.pdf>

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