

## ***Interactive comment on “Framework for assessing lateral flows and fluxes during floods in a conduit-flow dominated karst system using an inverse diffusive model” by C. Cholet et al.***

**Anonymous Referee #1**

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The paper is about the calibration of a diffusive model used to simulate mass and contaminant transport inside a karst conduit network. Authors assume the approximated Saint Venant equations to hold in the reach between two gauged sections, where discharge and concentration are measured, and the aim of the study is the evaluation of the lateral mass and contaminant inflow temporal behavior. Authors apply analytical solutions already provided in the past by Moussa and carry on the calibration by means of a trial-and-errors procedure. The paper has the following limits that, according to my opinion, make questionable the publication of the paper on the Hess journal:

- 1) The relevance of the analysis is not well explained. If we already know the time series of the input and output mass and concentration fluxes, the average lateral inflow

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is simply the difference between input and output average values. Why the temporal variability is so important? 2) The temporal variability of the lateral  $q$  flux is strictly related to its spatial variability, which is assumed to be known. In real problem of karst conduits, what is the error of this estimation? In Eq. (6) we find also the spatial derivatives of  $q$ . What is the effect of possible spatial discontinuities of the  $q$  function? 3) In the application to the study site any validation of the computed lateral flux is missing.

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