We would like to thank the referee. These pertinent remarks allowed us to improve our article. We answer here point by point to these remarks and we modified the article when it was necessary.

- *section 2.3.4 velocity threshold: could you justify the threshold ? Do you have a reference ? Could you explain more this choice ?*

This threshold can be explained physically by the real friction wich occurs on flows. The friction models used can miss this physical threshold in rare cases (quasi-vertical slope with rain for example). This results in the appearance of abnormally high speeds in small areas of simulation. These velocities do not question the validity of the simulation because it concerns very small quantities of water, but on the other hand it drastically decreases the time step and thus increases significantly the simulation time. The velocity threshold is chosen in the order of 10 m/s in an empirical way. We verify at the end of the simulation that this regularization of the velocity has been done in very small areas not questioning the validity of the simulation.

- *section 2.4 AMR line 8: why do you choose 2/3 ? Is it usual / your choice ?*

The value must be less than 1 to create a hysteresis cycle and thus avoid the refinement / unrefinement round trips in loop. This is a classic value.

- *Fig 8 and 13: To avoid the difference between the experimental and b-flood results, why don't you add the outlet volume of water ? It should then fit the red curve ?*

Yes, by adding the volume of water leaving the simulation, the curves would overlap. This volume must be calculated and is not a direct data. In order not to add complications, and verifications, we have chosen to represent only data directly extracted from our simulation without any calculation on our part. This is enough to prove that our inflow is the right one.

- *Fig 10 and 15: what is the use of the time delay ? You did not comment on these results.*

In order to avoid any confusion and thanks to the referee's feedback, we have changed the name of this time to "arrival time delay". The definition of this term can be found on p.12 l.8 of the article. We have also added comments on this term in the "Fluvial case" and "Urban case" sections.

- *page 13 lines 1-2, and page 14 lines 18-19: One can say that b-flood is able to reproduce this Toce example, it cannot be generalized to all the floods on impermeable soil with houses.*

Indeed, we have overgeneralized this case study. We have modified the article accordingly.

- *page 14 line 22: could you explain the limit to small watersheds (less than 100 km2)?*

This is a usual limit. This roughly determines the responding watersheds with characteristic times of the order of an hour. They are thus particularly well adapted to this type of simulation.

- *page 17 lines 1-8: is it usefull to have a DMT with a resolution of 1 m when the space step is of several meters ?*

The DMT used is the one provided by the IGN. The code then averages it to make a coarse grid. The more accurate the grid used, the more accurate the coarse grids will be.

- *How do you consider a river that is smaller than the space step ?*

A river smaller than the space step will therefore influence the coarse grid: the reconstructed coarse value will therefore be lower.

- *How can the flow be continuous if the river is ”crossing” the mesh ?*

I don't quite understand the question. The water flow is always discontinuous and this does not hinder its modeling: it is a property of the finite volume method.

- *Fig 18: you claim a ”good qualitative behavior” but no measurements are shown to compare the simulated results and what happened. Could you explain the differences with the results of: G. Kirstetter, F. Bourgin, P. Brigode, O. Delestre. Real-Time Inundation Mapping with a 2D Hydraulic Modelling Tool Based on Adaptive Grid Refinement: The Case of the October 2015 French Riviera Flood. Advances in Hydroinformatics, pp. 335-346, 2020 (Simhydro2019), obtained with Basilisk ? This reference should be added and explained in the article.*

That's an excellent point. This other article was done later but was published earlier, which is why we forgot to mention it here. We have added a paragraph in the article about it.

Technical corrections

- *Is there a capital letter in the name of the software ? Homogenize the title and the rest of the paper.*
  Done.
- *page 1 line 13: in the Gard region, the flood occurred in September, not June 2002.*
  Done.
- page 3 line 24: () are forgotten in the equation number.
  Done
- *page 4 line 9 : $\forall i.\Delta x_{min}$ could be misunderstood, add a word at the beginning of the last sentence.*
  This paragraph has been corrected
- *page 9 line 6 : I don’t understand the ”missing numbers”, each gauge has a number ... ?*
  Explanation added in the article.
- *Fig 7: Impossible to read the legend when the article is printed, enlarge the figure ?*
  Done.
- *What are the meanings of P, S ?*
  These are the two types of measuring stations. You can find more information in their articles.
- *Fig 8: the volume is not mentioned in the caption.*
  Done.
- *Fig 9: no legend: values of the water height and of the mesh refinement ?*
  These images were created by the code during the simulation. We just specify the min and max values and the code builds a linear color scale from them. We added the min and max values in the legend.
- *Fig 10: Impossible to read the values when the article is printed, enlarge the figure ?*
  Done.
- *Typo : ”ant” in the caption.*
  Done
- *page 12 line 6: ”time delay” instead of ”delay time”.*

Replaced by "arrival time delay"

- *Fig 12 : the names of the gauges are the same as fig 7 but they are not located at the same places.*
  This is the choice of the experimenters. See their article for more information.
- *Fig 13: the volume is not mentioned in the caption.*
  Done.
- *page 13 line 15: sentence which does not contain a verb.*
  Corrected
- *page 14 line 1: refer to section 2.2 for the abrupt topography.*
  Done.
- *page 14 line 4: a ”s” is missing in ”figures” or change ”these”.*
  Done.
- *page 14 line 27: the euros (dollars ?) symbol must be changed twice.*
  Done.
- Fig 14: no legend: values of the water height and of the mesh refinement ?
  Done.
- *Fig 15: Impossible to read the values when the article is printed, enlarge the figure ?*
  The figure reads well on the pdf. This may be due to the configuration of the printer.
- *The time delay is not mentioned in the caption.*
  Done.
- *Fig 17: Impossible to read the legend when the article is printed, enlarge the figure ?*
  The figure reads well on the pdf. This may be due to the configuration of the printer.
- *page 17 line 18 : refer to section 2.3.4 for the threshold.*
  Done
- *page 22 line 5 : ”B-flood” to change into ”b-flood” ? The link is not correct, one must change the B to the lower case. Also add the first names of the authors.*
  Done