Reviewer comment:

This paper documents an important flood event that was caused (as the reader finds out by himself step by step reading the paper and then explicitly finds explained at line 243) by the superposition of two floods, one of which was caused by the Niedów dam-breach.

I reviewed the first version of this paper at the beginning of the year and its readibility has been definitely improved but however I am sorry to come to the conclusion that I still believe that it is unsuitable for publication in its current form. Apart from a set of typos, naïve statements (e.g., in the Abstract, "The flood event occurred downstream from the dam "), uncorrect use of technical terms (e.g., water table, that is a term used in groundwater terminology, in place of water surface; velocity coefficient for Strickler's coefficient) and undocumented statements, there is a fundamental bias that has not been solved yet.
At the core of the simulation and of all the reasonings there is the use of equation 1 (that is still written in a wrong way) to compute the outflow hydrograph from the Niedov dam. The point is that, even disregarding the time distribution of the outflow to the Berzdorf lake (only the overall volume spilled in the lake is documented in the paper but not its time distribution) and the variation of the stored volume in the floodplain (that does not appear in eq. 1 – and that is the reason for which eq. 1 is wrong -but that that must be calculated by MIKE21) , there are two unknowns functions in the equation: the discharge hydrograph QND from the Niedov dam and the discharge hydrograph from the Lusatian river QNL: this is explicitly said: "This enables the inflows QNL,in(t) and QND(t), …, to be found".
With a single constraint (equation 1) there are an infinite possibility to find different sets of QNL,in(t) and QND(t) to match QNL,Z (t), i.e., the discharge hydrograph for the Zgorzelec gauge station.

Authors answer

The numerical modelling problem is generally formulated in Eq. 1. Initially the term for retention dV(t) was not included as it is an inherent part of the 2D model solution. Unfortunately, corrected Eq. 1 went wrong in the final revision/edition stage followed by an oversight, but the term dV(t) is included in the text below.
Also the overflow to the Berzdorfer lake is calculated by the program. This flow over the embankment can be extracted in a function of time, however, there are no field data to verify this variation. In addition, it would rather have a relative minor impact on the flood propagation (taking into account the total valley retention of ca. 20 million m3), so the total overflow volume match is regarded mandatory.
Indeed, the reviewer's concern about the solution of Eq. 1 is right, given that there are two unknowns in one equation. One can further suggest an infinite number of solutions. However, there is much less possibilities given the restrictions and conditions the model had to satisfy (cf. section: *2.6 Field observations*). There are known upper inflow peaks timing and high water level marks and finally the outflow hydrograph (Zgorzelec cross section). Using these one can search for approximate hydrogram shapes. Of course, there is still a possibility of a variety of peak flows and hydrograph shapes, but those found in the paper reasonably satisfied the observation in the limit of the afforded 2D modelling. An iterative approach (trial and error) is applied as no other choice here, and the authors consider this approach as a major achievement of the work. We also see now the need for more clarification in this respect in the text and we are indeed thankful to the Reviewer for his comments. Obviously, the task was complicated by the data limited situation as it is typical for such events. Nevertheless, for the sake of this work the authors collected a vast amount of data which was also a great effort of different teams. Yet, these results have already been discussed multiple times and accepted by German parties involved in the International Commission for the Protection of the Odra River against Pollution.

Accordingly, failing to detail this fundamental point, as well other informations partly listed in the following, in my opinion the colored maps of Fig. 11 and 12, have no particular relevance because the overall procedure looks flawed.

We hope that after these fundamental explanations the Reviewer will change his opinion on the numerical approach and modelling results. Further, there are more detailed clarifications following the Reviewer's work:

Follow a list of more particular but important details that show that the paper has not yet been carefully reviewed by the Authors

Line	text	Observation
16	cauese	cause corrected
82	Maximum yield of the weir	?
118	The return period of the flood..	On the basis of what ? Analysis of Rainfall, maximum discharge ? Measured where ? The return period is evaluation based on the statistics of the yearly peak flows for the gauge stations. Explanation and reference added to the text.
120	On the 7th of August at the Ostrózno gauge station, the highest ˙ water level of the flash flood occurred at 16:40. The Ręczyn gauge station was recording the water level until the time of 15:20, and thus until it was destroyed due to	Here, as in many following points, you mention to the existence of gauge stations, but without showing the available data. A graph should be added with all the available measured level or discharge hydrographs at the relevant stations during the flood. On the some graph the timing of the most important events listed. A graph presenting recorded water levels will be added.
129	On the 7th of August, the estimated flood rate was 615 m3s/1	Delete. Already said at line above Done
134	The water level ...	Is there any recording of the water level as a function of time ? It would be important to show the elevation as a function of time and in correspondence the operation of the gates. There are data for all three closures available until the power supply was working. We reconsider adding a graph to the text.
138	After the water level exceeded the edge of the repaired gate,	What do you mean ? Explain better This sentence was changed to: After the water level exceeded the edge of the maintenance gate at the inlet to hydropower channel.

142	which is documented in Sup. 1	No, in the supplementary materials there are some pictures (where ?) and two maps. No other material is available on the dam Breach Finally not added due to copyright issues. Corrected.
167	Radomierzyce through the Mill channel.	Every place that is mentione in the paper must be retracebale on the map. I don't see this place neither in Figure 1 nor 6 which are the ones mentioned so far in the paper. At the same time, regarding the name of the rivers, you must use always the same name (Nysa Łuzycka River and e Lusatian Neisse River are probably the same river) and it must be the one that appears on the map The Mill channel is not indicated on Figure 1 and 6 due to the scale of the map (for clearance). Instead the Mill channel is indicated on Fig. 10, with a reference in text.
170	destruction (disintegration) of the buildings	Do you mean collapse ? Yes. corrected
173	it flooded the Hagenwerder estate	As at line 167 The Hagenwerder estate is located next to the Pliessnitz mounth.
175	city of Zgorzelec on the Polish side (the peak of the wave in Zgorzelec was at 6:40 UTC)	Here one starts realising that a second flood is superimposed to the dam breach wave but considering that you do not clearly explain this point in advance one is left puzzled at how it is possible that the dam breach wave takes so long to get to this town. Explanation amended in the text.
203	To restore	Such a wording was found in a publication.n We change it e.g. 'to determine' (we noted such a wording in a publication).
207	Equation 1	This equation is wrong because it does not include the dV/dt term. In the following text you list dV, that does not appear in the equation but this is another error because dV is a volume and is not dimensionally coherent with discharge Q. The equation is corrected, the following text included the term dV (t)
213	dV	dV does not appear in the equation but this is another error because dV is a volume and is not dimensionally coherent with discharge Q. as above

215	Measured discharge	Did somebody actually measure the discharge during the flood ? This is a complex task: how did they do it ? The discharge was measured by a team of the hydrometry service of the Institute of Meteorology and Water Management (measurement made from the bridge in Zgorzelec).
218	This enables the inflows QNL,in(t) and QND(t), while taking into account the additional inputs of the Pliessnitz and Czerwona Woda rivers (which were relatively insignificant), to be found.	In my opinion there are a lot of ways to match the measured discharge with different input hydrographs. You do not discuss this point in sufficient detail. Using an iterative approach, by trial and error one can determine approximate input hydrographs given the peak timing and additional data available / restrictions. Additional explanations on this procedure to be added in the corrected text.
231	Velocity coefficient 1/n	This is what everybody call Strickler's coefficient. By the way in the map in the supplementary file you show Strickler's coeffciect as low as below 2.5. This is actually an unbelievable value: which type of ground cover did you model with this low value ? The M coefficient (MIKE notation) or Stickler coefficient is sometimes called as the velocity coefficient because the flow velocity is proportional to it. As we keep M notation we further assume the term 'roughness parameter (l.232)". By the way – for building areas the M value was set to 1.
245	Fig 11	Why ? (see Fig. 11) - removed.
258	the flooding at 10:00 on August 8, 2010, when the flood peak reached the city of Zgorzelec	From figure 12 one would say between 6 and 9 AM. As a result of the conducted simulation, Figure 12 illustrates the flooding at 10:00 on August 8, 2010, <u>soon after</u> the flood peak reached the city of Zgorzelec.
264	based on the water level increase in the lake	Having the variation as a function of time would be another important calibration point. But nothing is shown in the paper about this important point There are no data regarding the variation of the overflow to the Berzdorfer; only the total volume is known. Hence, the overflow volume computed by the program was linked with the local water level, which

		depended on the maximum discharge in the river (including the outflow from the broken Niedów dam) and to the roughness values.
266	The total volume of released water due to the dam's failure was equal to 22 million m3	No, this is false. Due to the dam failure only the volume stored in the reservoir was released, Right, additional outflow from the reservoir was ca. 5 million m3.
275	the travel time of the first flood peak from the outflow from the Niedów reservoir to the Zgorzelec gauge station took about seven hours	This is really strange, considering that the two cross section are probably 10 kms apart. It would imply an average velocity of about 0.4 m/s that is really low for a dam breach flood. This point should be discussed better… This is not strange given the topography, relatively low slope, meandering river character, vegetation influence, retention increased by two weirs. The model simulations are in agreement with the observation at the Zgorzelec gauge station. This issue will be additionally commented.
285	A particular feature of the Niedów dam …. was the fact that the homogenous embankments made of sand and gravel had a concrete facing, which acted as an impermeable barrier.	To be honest I was surprised to hear than an earth dam was totally made with sand with a permeability coefficient of 2.8×10-3 ms−1, that is huge, without any impermeable core. Accordingly, the waterproof coating on the inner side of the embankments was totally mandatory and is certainly not a "particular feature" but a must. Rather, I would have concentrated my discussion on two considerations: 1) the 1/100 year return time for the design discharge of the dam was clearly inadequate. 2) the maintenance of the hydropower station that apparently led to the cut-off of the power supply and so contributed to the disaster, was scheduled without the needed attention to the possible occurrence of a flood in that period of the year. Description corrected

Table 1	Apparently the dynamic of the gates opening is in contradiction with the text where you write that "The crew still tried to open more gates manually from the dam's crest, but were unsuccessful." Accordingly, one would expect that after

	15:36 the gates stay fixed in their position. Moreover, if a leve recording is available at Ostrozno it should be plotted as a function of time To be clarified
Table 2	The peak discharge is a result of your model ? You must specify it Yes, this value is calculated by the model and will be specified accordingly.
Figure 2	Add ruler for distances The ruler has been added
Figure 6	You show the state borders (which are pretty unrelevant and should be dropped) but not the border of the catchments The state borders are removed
Figure 10	Gauge ZgorZelec appears twice. Which is the right one ? Moreover in the paper all the level/discharge recording at the different gauge stations must be shown as a function of time during the event. A figure showing water level hydrographs for gauging stations will be added.